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Glasse

Revenge and Redress among the Huli :¹ A Preliminary Account. By *Robert M. Glasse*,
Temporary Lecturer, Department of Anthropology, University of Sydney.

Primitive societies without governmental institutions of their own have been found in all parts of the globe. These societies have no officials with the recognized right to settle disputes, enforce decisions or punish offenders. Nor is there any person or group with the legitimate power to take administrative action, make laws or command military enterprise. Yet these societies have such well-established and well-known systems of law and morals, convention and ritual, that we may reasonably assume that they have persisted for many generations even though they have no written histories. Indeed some of these societies appear to be remarkably stable. How then, we may inquire, do these stateless societies maintain order and cohesion? What processes regulate or govern public life? How is social control achieved?

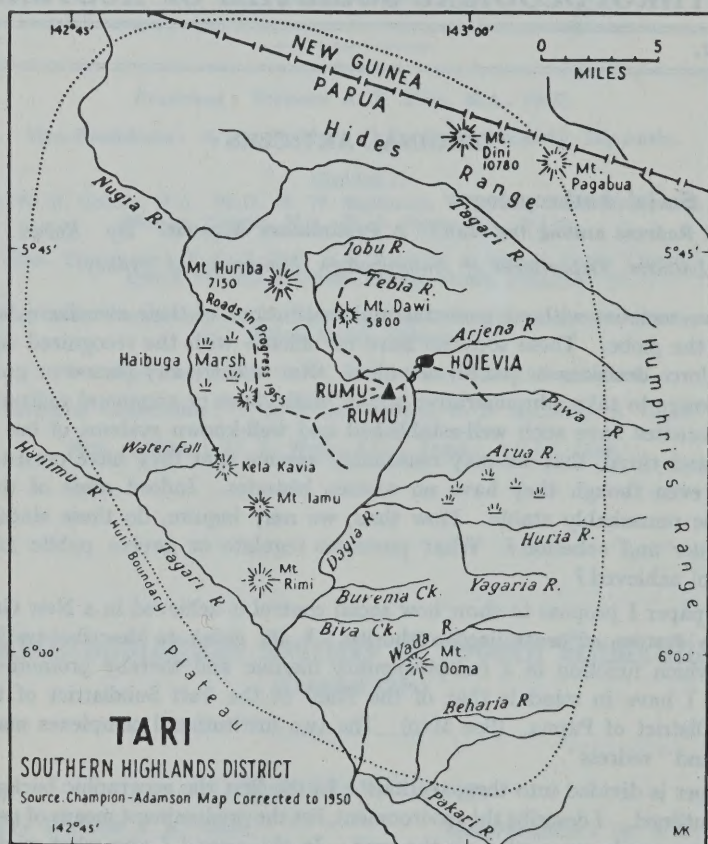
In this paper I propose to show how social control is achieved in a New Guinea society that has no system of centralized authority. I am going to describe two institutional complexes which function in a complementary manner and thereby promote social order. The society I have in mind is that of the Huli² of the Tari Subdistrict of the Southern Highlands District of Papua. (See Map) The two institutional complexes may be termed 'revenge' and 'redress'.

The paper is divided into three sections. In the first the geographic background of the problem is outlined. I describe the environment, list the predominant means of getting a living and show how people are settled on the land. In the second I give what might be called a 'profile' of Huli social organization. Instead of presenting a 'portrait in depth'—which would take many hours—my method will be to compare and contrast the 'social personalities' of three men: one of average status and wealth; one of inferior position; and one exceptional man of great wealth and wide renown. I mean by 'social personalities' their patterns of association and allegiance; their residential histories; and their goals and ambitions. From

¹ This paper was read, in a slightly abridged form, at a meeting of the Anthropological Society of N.S.W. held at the University of Sydney on Tuesday, 29th April, 1958.

² I studied the Huli from April 1955 to June 1956 as a Research Student of the Department of Anthropology, Australian National University, and am indebted to that University for generous financial support of my fieldwork.

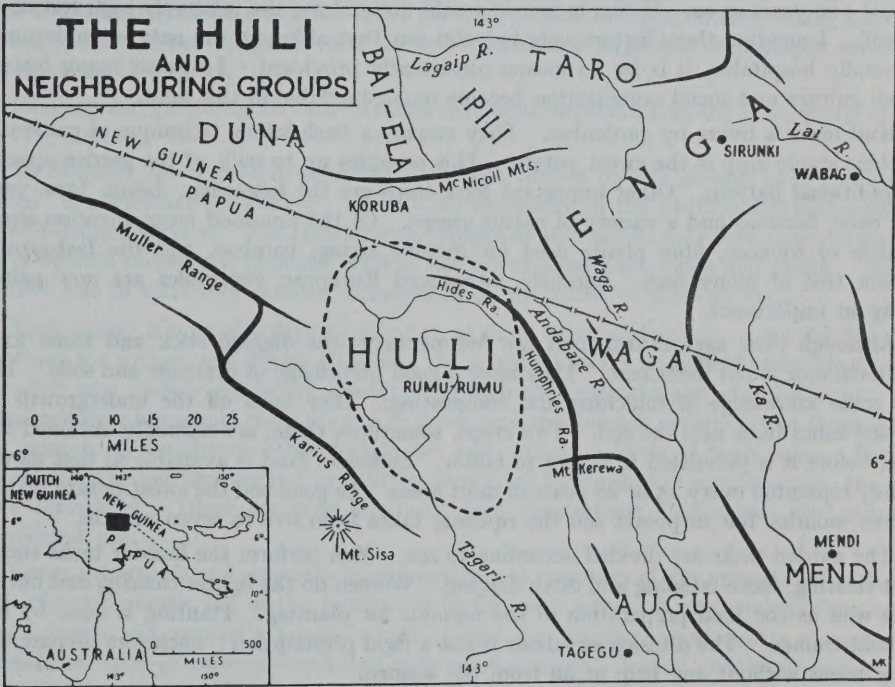
these three descriptions I hope you will be able to infer a good deal about the nature of Huli social organization. For I will have time only for the crucial sociological issues relevant to my central thesis. In the third section I discuss the two institutional complexes which give title to the paper and show how their functional inter-relation gives rise to a kind of social ordering or social control.



My central thesis is a simple one. It is that in order to exact vengeance the small local groups of the Huli form temporary alliances: but these alliances are unstable because once the act of vengeance is completed, hostility develops between the allied groups due to the working of the system of redress. Revenge defines enemies and allies, but when the fight is over, the principles of redress divide the allies who fought as one. The result is that powerful factions are never able to fully develop. Revenge and redress ally and oppose different combinations of groups over a period of time and thereby promote an uneasy integration and a kind of balance within the wider social order. So much for preliminaries.

I

The Huli environment is reasonably pleasant and hospitable. Although Tari is only six degrees from the Equator, it is sufficiently elevated so that the extremes of Tropical Climate do not occur. The main territory inhabited by the Huli consists of a series of relatively flat valleys, 10-15 miles wide, separated by rolling hills and a few sharp ridges. The general level of the valley floor is between 5,000 and 5,500 feet above sea level. The slope of the country is to the southeast, where the Tagari River which drains Tari, becomes known as the Kikori and eventually empties into the Papuan Gulf.



The climate is generally pleasant but is subject to occasional extreme fluctuations which result in damage to the native crops. In the early afternoon the maximum daily temperature of about 80° F. is reached; the night temperature falls to a minimum of about 48° F. This pattern is the same throughout the year. Rainfall averages about 100 inches a year, if the recorded figures for three years prove to be representative. There is no obvious pattern of wet and dry seasons and the natives plant crops all year round. Too much or too little rainfall results in crop damage; occasional frosts have the same consequence: both lead to famine conditions.

The natural vegetation of the area is classed as Mixed Mid-mountain Forest, characterized by an oak-conifer association. Much of this forest has, however, been cut down, burned off or ring-barked to make room for native gardens. There are no ferocious animals of any

importance. The main species represented are the following: opossums, tree kangaroos, rodents and a few kinds of snakes and lizards. Domestic pigs occasionally escape and go wild. Bird life is very rich by contrast: over one hundred species have been identified. To the native the most important of these include: the cassowary, several species of birds-of-paradise, various members of the parrot family and other colourfully plumed birds. Eels are occasionally found in the rivers as well as a few tiny fish: but neither are of much importance in the Huli diet.

In passing I should mention that Tari is subject to shocks and earth tremors of considerable violence. It is also possible that the area has been subject to volcanic activity within the past 100 years or so. If this is true it would account for the relatively high fertility of Tari soil. I mention these factors only to point out that although the natural environment is generally hospitable, it is by no means consistently provident. I suspect many features of Huli culture and social organization become understandable in this light.

Huli make a living by gardening. They employ a bush-fallow technique of cultivation and their staple crop is the sweet potato. This occupies up to 90% of the garden space in the traditional pattern. Other important food crops are the following: beans, taro, yams, sugar cane, bananas and a variety of native greens. Of the non-food crops mention should be made of tobacco, fibre plants used for making string, bamboo, and the fast-growing casurina tree of many uses. Recently introduced European vegetables are now gaining rapidly in importance.

Although their agricultural tools are rudimentary—the digging stick and stone axe—their technique is not inefficient. They have a good knowledge of drainage and soils. They have some knowledge of mulching and composting. They burn off the undergrowth and turn the ashes back into the soil. Two crops, sometimes three, are normally obtained from a site, before it is permitted to return to fallow. Sufficient land is available so that gardens are only replanted every 15 or 20 years in most areas. In good soil the sweet potato matures in three months, but in poorer soil the ripening takes from five to seven months.

The garden tasks are divided according to sex. Men perform the heavier tasks such as forest clearing, fence building and ditch digging. Women do the lighter clearing and burning off as well as the final preparation of the mounds for planting. Planting is done by both men and women. The division of labour is not a rigid prescription: bachelors prepare their own gardens without any help at all from the women.

Pig husbandry is the second major productive activity. The whole family is concerned with the care of pigs, but they are kept in the women's houses at night. During the day they graze in marshy areas or in spent gardens. The importance of pigs immeasurably transcends their value as food. Pigs are the currency of all major social transactions. They are the standards of wealth. They are productive capital. They are the sacrifices for the dead ancestors. Pigs are the very stuff of dreams, the subject of endless calculations and machinations. The Huli concern for their pigs appears at times to be almost obsessional. Few sights will gladden the heart of a man more than a gift of fat pigs. It is more than just a simile to say the social order is bound up with pigs.

The Huli scale of values in terms of pigs can be seen from the following examples. A stone axe was worth a breeding sow, before the advent of Europeans. The produce of a half-acre garden is worth two or three pigs. Bridewealth is more or less standardized at 15 pigs

for virgins. Death compensation payments vary between 30 and 150 pigs depending upon the circumstances. A man of average wealth owns about ten pigs; a wealthy man, up to 100 or even more.

Passing mention should also be made of two other native valuables: pearlshell and cowrie shell. These were traded in from the north and east, before the government station was established; this has now become the main source. The pearlshell was valued principally as a mark of status and wealth: it was, unlike the cowrie shell, little used as currency. Pearlshells were very rare at Tari before the government began to use them for purchasing land and paying wages; nevertheless demand for them has scarcely diminished. The cowrie shell is the traditional Huli currency for small purchases, such as bows, arrows, string bags and magical spells; it has religious value as well: especially large and well-shaped specimens are offered to the spirits.

Hunting and gathering are only of minor economic importance to the Huli, except during times of famine.

To describe the scattered distribution of Huli houses on the ground as a 'settlement pattern' is somewhat misleading; there is no regularity in the distribution that conforms to a well-defined pattern. The Huli have no villages at all: nor do they even have permanent, clearly defined ceremonial grounds, such as are found among the Enga and Waga. Instead the Huli live in relatively isolated homesteads in the midst of their gardens.

Each family is normally divided into two or more household groups: one for the men, the others for women and young children. In a typical men's household there are three or four adult men, closely related by kinship, and their sons over the age of about eight. In a typical women's household there are two or three unrelated women—wives of the above men—their unmarried daughters, other female kin and young children of both sexes. But the women who live together are not necessarily associated by kinship or marriage with the same men's household. There are over-laps and part associations that make the picture a complicated one.

Entry into men's and women's houses is taboo to members of the opposite sex. In fact much of the domestic life of the family—in so far as it acts as a unit—takes place out of doors. Men's and women's houses which shelter the family are normally separated by distances of from 30 yards up to a half mile or even more. I shall give some examples of this separation later on.

The overall area inhabited by the Huli is not accurately known, but is estimated to comprise about 750 sq. miles. No census has yet been taken of the Huli, but they are estimated to number 20,000 to 25,000. If these figures prove to be correct, the overall population density is of the order of 30–35 persons per sq. mile. But since this figure does not take account of extensive marsh areas and tracts of uninhabited forest, the actual density of the cultivated areas is two to three times as great. In the most densely settled areas that I know of the density is about 120 persons per sq. mile. This is not a large figure compared to similar regions in the highlands.

On the average there are about 8–12 houses per sq. mile, each of which is separated from its neighbour (not counting associated women's houses) by a distance of about one half sq. mile; but there are many deviations from this figure in both directions.

Although they live in relatively isolated dwellings, the Huli are nevertheless organized into land owning groups which are of fundamental sociological importance. I am going to call these basic land units 'parishes.' The social group which resides on a parish, I will call a 'local descent group'. For the sake of the argument which follows it is important to keep the distinction between a parish and a local descent group in mind: the former refers to a unit of land; the latter to a social grouping.

Parishes are named after the local descent groups which reside on them, and these in turn take their names from ancestors. Parishes vary in size and contour; the smaller parishes extend for about one-half sq. mile, the larger for two or three sq. miles. They are bounded by natural geographic features or by deep man-made trenches. These trenches are V-shaped, measure 10-12 feet in depth, and are usually bordered along their edges by thick growths of pit-pit grass. Besides serving as boundaries, these trenches have a defensive function: their pit-pit overgrowth serves as an arrow screen and as an obstacle difficult to broach without warning. In addition these trenches serve as a network of passageways which intersect the valley floor like a virtual street system; but these passageways are barricaded off in time of danger.

During peace time the division between parishes is not of great importance: in the pursuit of their daily activities men and women range widely over the countryside; but when war threatens the inhabitants of a parish, they draw together and seal off their borders as best they can.

This brings me to the close of the first section; in it I have given a brief account of the natural environment, the means of getting a living and the nature of the settlement pattern, particularly the unit of land I called a 'parish'.

II

My second task is more difficult. I intend to give an idea of the nature of Huli social organization without going into elaborate detail or relying on a highly technical vocabulary. Instead of giving a precise sociological description, I am going to try and communicate this information by a simple device; this device is not of course a substitute for a definitive account, but will, I hope, suffice for my present purpose. The device is a simple one: I describe in some detail the 'social personalities' of three men; I mean by 'social personalities' their affiliations, residential histories and their goals and ambitions. The three men I have in mind are all real persons that I knew intimately in the field; each, however, is also representative of a type of individual found in Huli society; from these descriptions I think we will be able to draw a number of inferences as the general nature of Huli society. Later on I will augment this description with a brief summary of crucial points.

The three men are named Tagema, Igibe and Handobe. Tagema is a man of average status for his age, but his pig wealth was low when I knew him as a result of a recent pig epidemic. Igibe was a man of inferior status and character according to Huli standards; the Huli phrase which describes him can best be rendered 'rubbish man'. Handobe was the very opposite: a powerful man both in mind and body, his behaviour conformed closely to the Huli ideal of how an important man ought to act; measured by Huli standards, Handobe is indeed an exceptional man, but despite his personal power and influence, he possesses no legitimate authority.

In what follows I will use the present tense for the sake of vividness. Let us consider the average man, Tagema, first. Tagema is about 35 years old. He is married to three wives and would like a fourth; he has six living children and three others have died. His men's house is situated on Tobe parish; at present he shares this house with a younger married brother and six of their sons of various ages. Two of Tagema's wives live in a women's house a quarter of a mile away; the third lives in a women's house on another parish about a mile and a half away, but Tagema and his third wife are nevertheless on good terms. Tagema has lived on Tobe parish for about five years; the right to live on it is derived through his maternal grandmother. Before coming to Tobe parish, Tagema has lived for relatively long periods with three other local descent groups. He left one parish following an argument with his father; he left a second when the soil of his garden sight was exhausted; he left a third with no other motive than to visit other kinsmen: during one of these visits he decided to take up residence with his Tobe kin.

At present Tagema cultivates gardens on a number of parishes. He has one large garden at Tobe parish; he is preparing a second on a nearby parish in which he has land rights; he has a third on the parish of the group with whom he was living before he came to Tobe: these three are his most important gardens. Tagema has in addition small gardens on the land of three other parishes; he has received cultivation rights in these three areas for helping various friends and kinsmen to clear the forest, but he does not hold land rights in these groups: he must relinquish these gardens when a cycle of cultivation is completed. Tagema is also entitled to a portion of the gardens of his three wives, that is to say the gardens which his wives have on their own (his brothers-in-law land) parishes; Tagema has no rights of ownership in these gardens, but he is entitled to use them because of his wives. In the past Tagema has also maintained gardens in eight other parishes to which he is connected by one descent link or another.

Tagema can recount his genealogy for 15 generations in the male (agnatic) line; for 12 generations in his mother's line (matri-agnatic descent line); and for an average of 6 or 7 generations in other branches of his genealogical tree. He knows of 26 parishes all told to which he has some descent connection; he has actually resided or gardened on 18 of these 26 parishes at some time. It is true that Tagema's knowledge of genealogy is exceptional for a man of his status, but his span of actually maintained relationships is not atypical.

Tagema is an honourable man. When kinsmen or friends from other parishes ask for help, he is quick to respond with bow and arrow. Perhaps he is a little more reluctant to assist his kinsmen or friends with pigs, but this is only because his present stock is low. He has little fear of sexual adventures, but he is careful not to approach the wives of close kinsmen, for this would be very bad behaviour. His primary loyalty, at the moment, is to the men of Tobe parish; he would support them in fighting against all comers, save for two or three local descent groups to which he feels too closely related to fight. Tagema's ambition is to acquire many gardens, many children and many pigs and to always have one young wife not sexually taboo as a result of nursing prohibitions. He has no desire, however, to become a really important man like Handobe; he doesn't want the moral responsibility or obligations that go with high position. Generally speaking, he is content with his present status; he expects and receives support from a wide circle of his kinsmen and friends both within and without Tobe parish; he is equally willing to give support in return.

REVENGE AND REDRESS AMONG THE HULI.



Fig. 1. A general view of the Huli landscape taken at Hoievra facing north.

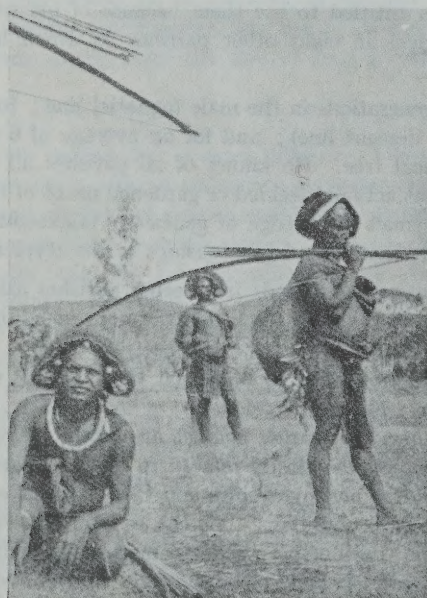


Fig. 2. Huli warriors, listening to a discussion of a death compensation claim: if the argument gets more heated it may result in fighting.



Fig. 3. A Huli bowman illustrates the technique of firing the bow.

From Tagema we turn to Igibe, the man of little worth. Igibe is about 27 years old. He lives at Kore parish, but is a newcomer; he came to Kore parish about six months ago when war threatened the parish he was residing on. He has one wife, but no children as yet. Although his entry into his present household was sponsored by a maternal uncle, he is actually connected to Kore parish by a combination of male and female descent links of which he personally has no knowledge. His wife lives in a nearby women's house.

Igibe's residential history is more stable than Tagema's. He prefers to stay put in one parish unless life there becomes too dangerous or too demanding. He has lived on two other parishes before coming to Kore, however he rarely travels more than absolutely necessary. At present he is sharing the produce of the garden of his sponsor, but he is helping to prepare a large new garden site on Kore parish and will receive a portion for his own use later on. He seldom visits his wife's family who live far away and she doesn't maintain a garden there.

Concerning genealogical and religious matters, Igibe knows little and cares less. He is aware of descent connections to only six local descent groups, but he can only trace the actual pedigree in one instance. He has little interest in any esoteric subject at all. He has never maintained more gardens than absolutely necessary and has little initiative where any hard work is concerned. Igibe is a greedy and slothful man much given to sexual adventures, but cautious lest he invoke the wrath of braver or more formidable men. It is even said that he seduced his own step-mother and had to flee the anger of his father when it was discovered.

As a warrior, Igibe has a poor reputation; he always manages to find his way to the rear in dangerous fights: but he does not shirk his duties altogether since there are not so many parishes where he is welcome. He seldom fully shoulders his responsibilities and never acquires full status in any group. He has little ambition save to acquire wealth without work; his greatest joy it appears is to attend courting parties, where he flirts with all the young girls even though he has no intention of acquiring a second wife.

Igibe and Handobe are poles apart in character and achievement. Handobe is in his middle forties, but is hard and tough and active. His high intelligence is evident in nearly everything he does; his knowledge of valued information is wide and accurate.

It is difficult to assemble an accurate residential history of Handobe. He has a men's house at Ambaru at present, but devotes much time to visiting kinsmen and friends. His right to reside on Ambaru parish has been derived through the male (agnatic) line, but he has been a resident on seven or eight other parishes for significant periods of his life. Though he maintains a very wide span of relationships, there are about eight parishes at present that he regards as home; he maintains gardens somewhat sporadically in these parishes, but takes an active part in their communal affairs. There are about six or seven other parishes where Handobe has maintained gardens in the past: he still has some voice in the affairs of these local descent groups and visits them from time to time. In addition to these parish connections, Handobe has pigs farmed out with various friends and kinsmen in several other parishes as well. His knowledge of genealogy is very wide; he knows his own descent connections back to and including all of his great-great-grandparents and beyond them for six or more generations of males; not only does he know his own genealogy in great depth and detail, he knows the genealogy of many other people as well. His memory is certainly impressive.

At present Handobe has five wives ; five others have died or been sent off for one reason or another. Through his wives Handobe has affinal relations with an additional nine parishes which he regularly maintains. Though travel and visits take up much of Handobe's time, he still manages to plant many gardens and oversee the breeding of his pigs. He has little time for his children, but since only one of the six is a boy, it doesn't matter greatly.

When Handobe was a young man, he was much like his father before him : a brave and daring warrior. Today he is still very able, but prefers to spend his time in oratory and negotiation. He is a politician of great poise and skill : master of threat and compromise, of making small concessions for large gains. Now at the peak of his influence, Handobe has an interest in the communal actions or nearly every nearby parish and many remote ones as well. He is often called on to advise in quarrels, but his suggestions are not always followed. In the presence of Handobe, young men forbear from smoking ; when he speaks there is quiet.

Unlike Tagema and Igibe, his sexual life is contained within the bounds set by the moral order ; to stoop to easy conquests or promiscuity is beneath his dignity. Like Tagema, Handobe is an honourable man. But the breadth and number of his obligations sometimes lead him into equivocal positions : he finds that he has an interest in both sides of a dispute. Sometimes he resolves this conflict by deciding his allegiance on the basis of the issue involved ; such high-minded conduct is rarely met with in Huli society. At other times he tries to settle the dispute by suggesting a compromise ; sometimes he remains neutral and does nothing.

It would be easy to go on speaking of Handobe and of the complexity and depth of his character ; he is the kind of person not easily forgotten : but I think I have said enough for my present purpose.

From these descriptions of the social personalities of Tagema, Igibe and Handobe, I think we can draw a number of important inferences as to the nature of Huli social organization, especially if we take into account the data about population density and distribution. Let me summarize these inferences before we pass on to the final section.

(1) There are roughly 300 or so parishes spread over Huli territory if estimates of density are correct. The local descent groups which occupy these parishes are themselves small in size. Most of them total less than 100 persons of whom the number of adult males would be less than 30%. These are small local groups, even by Melanesian standards.

(2) There are a large number of descent qualifications on the basis of which local descent group membership is possible.

(3) Group membership depends not only on descent qualifications, but upon actual behaviour in support of group goals and activities. In other words status within the local descent group is not automatic but must be validated ; this in turn implies that there are various grades of possible group membership : it is not an either-or proposition.

(4) Simultaneous membership in two or more local descent groups is possible, although different degrees of membership may be involved in each case.

(5) Residence rules allow a high rate of individual mobility, so that the composition of local descent groups is continually changing.

(6) Huli social organization derives its flexibility from the fact that a variety of descent connections are recognized as the basis for local descent group membership.

There are other relevant and interesting points to be made about Huli social organization ; I could go on to describe how certain advantages accrue to men living with local descent groups as agnates ; I could discuss the circumstances in which local descent groups combine for certain activities because of common descent : the whole question of segmentary structure and wider social groupings could easily fill another hour. But I think I have said and intimated enough for my present purpose. We shall, I hope, gain a deeper understanding of the working of Huli social organization in the next section of the paper : for now I deal with revenge and redress in relation to the social organization.

III

The first point to be made concerns how the Huli conceive of revenge in general. In their eyes revenge is the obligatory counter-action to breaches of their norms. Within the local descent group the norms of social behaviour are buttressed by the threat of expulsion or the withdrawal of group support ; serious breaches of the norms, therefore, occur less frequently than they do between members of different local descent groups. Nevertheless in cases of breach within the local descent group, vengeance may be resorted to by the injured person : but the form of vengeance is likely to be less serious in character. Internal breaches are usually resolved by hand-to-hand fighting or with sticks ; afterwards compensation is usually paid to mend any hurt feelings which remain.

Here we are more interested in breaches which take place between members of different local descent groups—call them external breaches—which are generally met by retaliation of one sort or another. The Huli concept of revenge, however, is not one of only equivalent return : they seek to inflict a more grievous injury than they have received, even though this usually results in counter-action in return. If a pig is stolen, a dozen of the thief's pigs will be taken in return if his identity is discovered ; if a kinsman is killed, the dead man's relatives will seek to kill four or five enemies in return. There is no precise scale as to the amount of vengeance which ought to be exacted for each offence : but the principle is clear : to inflict greater damage than was received.

I am not going to say very much about the specific kinds of breaches which give rise to vengeance ; but among them the following are most common : insult, adultery, seduction of young girls, theft, damage to gardens or other property, failure to meet obligations, such as the payment of compensation and finally attempted or actual homicide. It is not always possible to discover the initial injury which results in vengeful action : there may be a long delay between the breach and the retaliation ; indeed, some grievances or injuries are passed on, as it were, from father to son, so that though the reason for vengeance may be forgotten, the impulse remains. In about two-thirds of the cases I recorded, the causes turned out to be retaliation for early acts of vengeance.

The particular breaches which result in conflict often have their roots in the social structure itself. For example, the method of distributing bridewealth or of indemnities, usually results in dissatisfaction in some quarters, due to the fact that a number of principles may be adhered to in the apportioning ; principles whose application would lead to contradictory results. Grievances which stem from these sources, nursed and brooded over for long periods, may finally culminate in counter-action when a favourable opportunity presents itself. Thus the absence of clearly defined standards of distribution results in

conflicts that may be termed 'structural'. Structural conflicts inhere in the social system. Personal grievances may be reconciled by one means or another: but structural conflicts are unending.

The Huli have three methods of exacting vengeance, namely, poisoning, sorcery and warfare. Poisoning is the covert form of vengeance: it is carried out secretly with a specific person as a target; sorcery is less secret than poisoning and usually involves all or most of the adult men of a local descent group. That sorcery is being performed, cannot be kept hidden for very long because of the nature of the rituals involved: but the target of sorcery, the offending group, is generally not well-advertised; the sorcerers hope by this concealment to escape demands for recompense later on. Warfare is of course overt and public: when a fight breaks out, the news is 'telegraphed' across the valley by a kind of yodelling. Warfare is by far the most important form of vengeance as we shall see: most of the discussion will be concerned with it.

Poison is normally administered by a single man who may, however, enlist the services of a specialist to prepare the potion. The efficacy of poison is believed to derive from its physical nature and not from spells or rituals as in the case of sorcery. Menstrual poisoning techniques are commonly employed by women; when a woman has a grievance against a man, she will entice him to have sexual intercourse with her during the latter portion of her menstrual period. Men are aware and afraid of this method of poisoning and thus are somewhat dubious about accepting casual invitations of this nature if they have any reason for suspicion. It is believed that a man poisoned by this method will sicken and die after three months unless effective counter-measures are taken; the symptoms correspond to those which result from internal infections which are quite common: although they may be caused psychosomatically. The belief is that the menstrual discharge enters the penis of the man and penetrates to his internal organs.

Not only do women employ this method for their own ends, they are sometimes hired to carry it out by their own male kin. The menstrual discharge of a virgin is regarded as especially potent, but it is administered by another means. A smear of menstrual discharge, mixed with the belly-button of a child not six weeks dead, together with a number of other loathsome ingredients, is regarded as particularly effective. Judging from the details of its composition and preparation, this mixture may, in fact, be genuinely poisonous.

To detect the presence or action of poison, the Huli resort to several methods of divination, but we need not consider these here. There are also tests which are believed to reveal the identity of the poisoner, so that vengeance can be exacted. Several types of antidote are used to treat poison cases, some of which are avowedly 'medical', so to speak; while others depend upon enlisting supernatural aid. Poisoning is the form of vengeance preferred by cowardly men and others embittered against their own kin.

The rites and beliefs of sorcery are complicated and involved. Usually there is a long sequence of ritual actions which must be precisely followed if the method is to be successful; and while these rites are being practised, the sorcerers are usually bound to observe sexual and food taboos as well or else the sorcery will not succeed. When sorcery is not 'successful', it is believed that either a ritual sequence has not been properly followed, or else one of the taboos have been broken. Sorcery is believed to take its toll in many guises: it has no precise symptomology. Thus deaths which occur accidentally, or as a result of disease are

usually explained in terms of sorcery by the Huli. They even go so far as to conduct a kind of autopsy upon the corpse: the chest cavity of the deceased is hacked open with a sharp stick, the lungs, heart and kidneys are examined, and from whatever markings are found, the coroner decides who was responsible for the death. Retaliation follows.

The point to be noted here is that sorcery is a technique of vengeance used by one local descent group against another or against several others. Its target is not a specific person, as is the case in poisoning, but any member of the offending group, man, woman or child. The mechanics of sorcery are believed to work directionally, that is to say the sorcerer aims in a particular direction and any one in the target line may suffer as a result. The detection of sorcery and counter-measures are also highly institutionalized procedures, but we need not consider them for our present purpose.

I turn now to the most important form of vengeance found among the Huli which I will call 'warfare'. Warfare is perhaps not the best term to describe fighting among the Huli, but since I know of no better one, it will have to suffice. The difficulty in using the term 'warfare' in my view stems from the fact that it is generally used to refer to a state of organized and coordinated aggressive action that is only approximated in Huli society. At any rate, I am going to use the term 'warfare' in a somewhat special manner, a manner which can be best indicated by contrasting 'warfare' with 'feud'.

Warfare is in my usage the more general term; it refers to a state or condition of more-or-less organized hostility that is widespread and always involves alliances between local descent groups. The last criterion—inter-parrish alliances—is the crucial one that must be emphasized. 'Feud', on the other hand, as I will use it, is a more private, limited and opportunistic form of vengeance or aggression. It usually concerns only two local descent groups situated in relatively isolated parishes, for feud between neighbours is severely disruptive. When allies come to the aid of either party of a feud, then it becomes warfare.

Warfare mobilizes the men of many parrishes, usually culminates in a sustained engagement which may stretch over several weeks or even months, and is finally terminated, when the losses on either side have balanced out for a formal, negotiated peace. Feud, on the other hand, is interminable and progressive; it may lapse for periods of several weeks, months or even years, only to recrudesce when opportunity presents itself. The tactics of warfare are frontal and flank attacks by parties of wildly screaming bowmen; the tactics of feud are raid and ambush: the swift, stealthy foray followed by hasty retreat after the damage has been done. The aim of warfare is general destruction: houses are burnt, gardens are destroyed and men, women and children are slaughtered without mercy. The aim of feud is limited destruction: retribution for a specific injury. The original cause—indeed, even the precipitating cause—of warfare is often unknown or obscure to many allies who come to join the issue: a dispute flares into a fight between two men; their friends and kinsmen come to their assistance; then allies from outside the two local descent groups originally involved are drawn in and the conflict spreads and gains impulse.

Feuds may sputter and occasionally flare for over a period of many years; alternatively they may grow into more general actions and become war: there is no guarantee that feud will remain feud. The losses in feud are usually small: one or two deaths, a few pigs, a ravaged woman, a burned out house. The losses of war vary with the scale of the engagement, which is in turn subject to its own internal and external dynamics. The largest war that

I have accounts of probably involved 700-800 warriors on each side at its peak ; it lasted for a period of nearly six months and resulted in 18 deaths on either side as well as many arrow wounds. It was terminated at the request of the initiators and, more generally, because food was getting scarce on both sides.

Other engagements of which I have record involved fewer contestants, were of briefer duration and resulted in less casualties. In small engagements, powerful men—like Handobe—were able to exercise some measure of control over the warriors ; but as the conflict spread and involved more and more allies, their influence tended to wane. Confusion was the result : the enterprise gradually lost impetus through lack of coordination and the failure of common purpose. Obligations of kinship were not the only force which drew allies into engagements : warriors joined the issue also for the glory to be won and for the sheer excitement and adventure of a fight. But the majority of Huli warriors were not fanatical in their purpose : after a few casualties had been sustained the taste of battle lost its savour. Some zealots there were : young men greedy for the honour of prowess ; and the newly bereft spurred on by the pain of their loss.

The jural basis of Huli warfare, and its internal dynamic, is founded on what might be called the doctrine of responsibility. A conflict generally begins between two persons. If these two persons belong to the same local descent group, usually the conflict will be settled by the intervention of other members who prevent overt aggression. But when the two contestants belong to different local descent groups, overt aggression is more likely to ensue. If allies are then called in from other local descent groups, the feud becomes war. But no matter how widespread the fight becomes, the two initiators are jurally responsible to provide death compensation when the war is terminated : this is the basic provision of the doctrine of responsibility. It is actually phrased in individual, not group terms, even though the local descent groups of the two initiators are obligated by kinship ties to assist them. Thus, in effect the burden of death compensation during war falls upon two local descent groups. Note that there is no concept of abstract justice, or of superior right on one side involved in the doctrine of war responsibility : every war has two initiators regardless of the issues in conflict ; and it is these initiators who must pay compensation for any allied losses sustained in their service.

I come now to the last portion of my argument : the institutional forms of redress and their relation to revenge. There are two types of redressive actions, but one is so rare as to be of negligible importance : the first is restitution ; the second compensation. The former need not concern us here since the Huli seldom regard equal restitution as sufficient to right a wrong ; a thief who steals a pig is never let off simply by returning the stolen animal or its equivalent to the owner. To steal a pig is a direct challenge to the status of its owner : he will demand five or six pigs in compensation if he is to be deterred from retaliation.

Compensation is the fundamental form of redress among the Huli. If a young girl is seduced, her father or brother will demand damages from her seducer on threat of vengeance ; if food is stolen from a garden, the owner will demand compensation if the thief is known or detected : the scale of compensation will be two or three times the purchase value of the garden.

There are several kinds of compensation among the Huli, but since my time is drawing near, I will discuss only death compensation tonight. Under this heading there are two main

categories: the first is ally compensation; and the second, enemy compensation. The former is undoubtedly the more important form, both from the standpoint of its frequency and its sociological importance as a factor in social control.

Ally compensation is the payment given by the respective war initiators to any local descent groups which have sustained losses in their service. It is not, however, a substitute for retaliation against the inflicting group: vengeance may also be exacted if the bereaved so desire; but in a large scale war, the identity of the slayer is often unknown. The payment of ally compensation is meant to mitigate the sorrow of the bereft; it is a recognition of social obligation for service rendered.

Enemy compensation is quite of a different order. It is only paid occasionally, and then not as a jural obligation of the same weight as allied compensation. The object of enemy compensation is avowedly deterrent: by paying it quickly to the enemy it may be possible to prevent retaliatory action from developing and thereby head off a potential feud or war before it becomes established. Enemy compensation is also usually paid when the enemy group happens to be a neighbour; the point is simply that one cannot afford to have neighbours with a grievance: this type of redress serves a palliative function.

As I have mentioned earlier, the internal dynamic which often leads to peace is the mounting pressure of responsibility which falls upon the war initiators. Neutrals or men with relatives on both sides will be asked to negotiate a truce; if the fight has been a large one the two sides may exchange an equivalent number of pigs: these pigs are known as 'pigs to make the war sleep'. The next step is to discuss and decide on the amount of damages that must be paid both to enemies and to allies. If there are dead to be buried or interred, these negotiations usually take place during the mortuary feast. The discussions are usually prolonged, but at length an agreement of sorts is reached between the war initiators and those who have claims against them; a token gift of pork is presented by the former to the latter as an acknowledgment of obligation.

The actual payment of compensation is usually delayed for many months and sometimes even years while the initiators breed up their stock; during this period the initiators are under obligation not to enter into any outside transactions that would involve the slaughter or transfer of pigs until the compensation debts have been paid off. The sequence of compensation is supposed to follow the order of deaths, but in practice all sorts of personal and local considerations may be involved. The result is that, with the exception of allies that sustained no losses and those who are compensated in the first instance, the result is that ill-feelings and strain develop between the initiators and their former allies. In fact as this strain increases, the former allies may resort to special tactics in order to force the initiators to hasten their payments; these tactics generally increase the strain between the former allies, even to the point where actual hostilities break out.

The scale of compensation payments depends on a variety of principles, but I will have time only to mention the most important ones. If the size of a war is small and its duration brief with only small losses, then high scale compensation payments will be demanded; up to 150 pigs may be paid for the death of a man under these circumstances. If a war is widespread, lengthy, resulting in many casualties, then low scale compensation payments will be sufficient; a standard of 30 pigs will be sufficient recompense for any death that has resulted. Payments for wounds are only made when these prove to be incapacitating; the scale is

generally up to a maximum of 15 pigs. The scale of payments is sometimes related also to the status of the initiators and the other groups. If one of the initiators is an important man with a great reputation to maintain, like Handobe, he may insist upon making very large payments to the former allies, thereby demonstrating his wealth and position. However, these over-scale payments are not entirely gratuitous: by pointing to his own generosity the big man is able to secure large payments of his own debtors.

I am not going to consider in detail precisely who is entitled to receive the compensation payments made for a death: this is a complex subject and I would have to go into much greater detail about kinship matters to make it clear. Suffice it is to say for my present purpose that the distribution of compensation reflects the residential history and kinship affiliations of the dead man: any of the dead man's relatives who have been socially important to him in life may receive a portion of the indemnities at his death. But the distribution is not automatic: those who consider themselves entitled must state their claims during the discussions; and their claims will be enhanced if they contribute to the mortuary feast. Even without more detail, I think you will see that this system of distribution breeds conflict: that grievances are easily aroused when some kinsmen of the dead man feels that his claim has been under-valued, overlooked or completely rejected. Under these circumstances feud among the relatives of the dead man may result, or alternatively the injured man may renew the original conflict by attacking the former enemy group again. The onus of this attack, though disputed, is generally regarded as falling upon the original war initiator: so the conflict starts all over.

Time will not permit me to enlarge upon this brief sketch of the Huli compensation system; but I think it will be understood even from this short account why death compensation assumes such a prominent place in argument and discussion. In point of fact every man regards his pig stock with the eye of an accountant: his obligations to support kinfolk in a variety of circumstances will diminish his stock; the payments of his creditors, if they can be effected, will increase it.

In the time that remains I want to draw the thread of my argument together and show how revenge and redress acting conjointly result in a kind of social control in Huli society.

Professor Max Gluckman has recently pointed out how there is a kind of peace in the threat of the feud.³ Although he had certain African societies in mind at the time, his argument is appropriate to Huli society as well. The argument runs that the 'peace in the feud' results from the fact that the outside interests and allegiances of local group members prompts them to oppose feud or war against groups to which they are connected or related in some way. We can readily see how the claims of multiple allegiance would have this effect to some extent in Huli society. But my argument goes beyond this.

The basis of it is the doctrine of jural responsibility in warfare and in other forms of revenge as well. With each new death, the war initiators bear a heavier responsibility to eventually pay compensation. Five or six deaths entail an obligation of 150 pigs or more and may involve the initiators in debt for a period of two years or more. This increasing burden often prompts the initiators to seek peace even when food resources are adequate and allies clamour to continue. The doctrine of responsibility is the internal dynamic of peace.

³ Gluckman, Max., *Custom and Conflict in Africa*, Blackwell, Oxford, 1955.

Much the same process is at work on both sides, since there is relatively little difference in the size of local descent groups or in their ability to enlist allies.

Over and above the internal dynamic of peace that lies in the doctrine of jural responsibility, is an even more potent influence or mechanism of social control. It lies in the separation and schism of allies that follows when a fight is terminated. Let me recount briefly: Deeds of vengeance lead to warfare drawing allies into the service of two war initiating groups. Alliances last until the struggle is terminated by mounting losses and food shortage. Vengeance thus leads to a kind of unity in the opposition of warring factions. But as soon as the war is terminated, allies must be compensated by the war initiators. This obligation gives rise to schism and disunity among the former friends. If enemy compensation should have to be paid, curiously enough, it tends to bridge the former gulf of hostility when it is paid over. The result of this process is that there is never any buildup of power beyond a certain point. Local groups are small and the disunity of alliances that results from the system of death compensation prevents powerful groups from emerging as a political unit. In other words, every war contains the key to its own termination; and every alliance is only temporary.

In closing, I should point out that the kind of social control upon which Huli society is founded, is self-regulating or self-adjusting. It requires no structure of systematic authority functioning at a political level: no system of centralized authority. By first uniting men in revenge, and then dividing them in redress, the Huli achieve a kind of social articulation or order that outlasts the bursts of conflict. Unable to develop, are the powerful political factions, capable of massive destruction and annihilation, that are the product of our own social order.

R. M. GLASSE.

Australia: Maternal Culture.

Massola.

The Wooden Shovels of the Aborigines of South-Eastern Australia. By A. Massola, Curator of Anthropology, National Museum of Victoria.

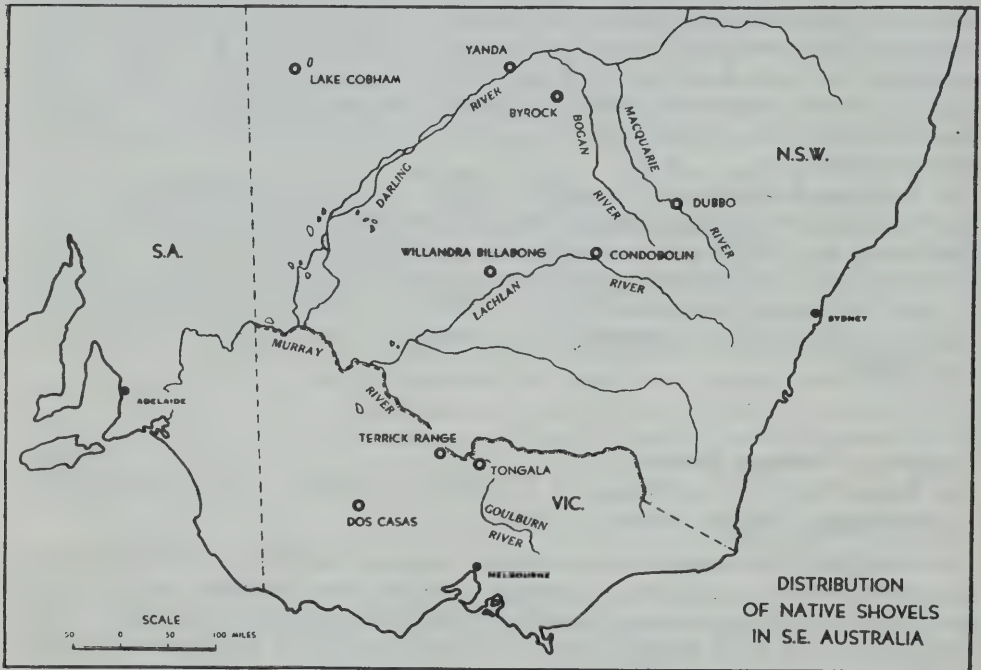
The object of this paper is to determine the former distribution of the wooden shovels of the Aborigines of south-eastern Australia. The only extant evidence is supplied by the few scattered references to this implement by earlier writers, and by a small number of actual localized implements in museums and in private collections in south-eastern Australia. This evidence is here discussed.

It is a well known fact that the natives of the drier parts of Australia used a scoop (pitchi) in lieu of a shovel for digging in the sandy soil for vegetable and animal food. But this scoop was not a specialized tool as this would not have been in keeping with the economy of a nomadic people. However, the more sedentary of the tribes actually set aside the older and rougher pitchis to be used for this purpose. Further, in the South Australian Museum there is an oval slab of flat wood, (Reg. No. A6390) measuring 11" by 7½" obviously made for this work, as it has no indication of a bowl. It was brought back from the Barrow Range, Western Australia, by the Elder Exploring Expedition, in 1895.

In the same museum are preserved two other scoops which also were not intended to be pitchis. They have a shallow, spoon shaped bowl, but were provided with a short handle, barely 3½" long, carved in one piece with the bowl, which in one (Reg. No. A6387) measures

18" by 6½" and in the other (A22272) 11" by 6". The former scoop is labelled as coming from North Central Australia, while the provenance of the other is uncertain, but as they are so alike, both must have come from the same general locality. However, none of these primitive forms approach the beauty of the shovels of the aborigines living in the drier parts of South-Eastern Australia.

The wooden shovels or spades formerly used by the natives of this region must be counted amongst the rarer relics of the race. Although they were restricted in distribution, it is strange that so few specimens have survived, as there cannot be any question that they were formerly a common tool in daily use amongst the aborigines.



The shovels must have been of great use to the natives, and no doubt would have spread rapidly amongst neighbouring tribes. To attempt to dig out of the sand a reptile or small rodent with the orthodox yam-stick is almost impossible. It is only logical to assume that the natives realized that a wide bladed instrument would serve the purpose better, and that the yam-stick was thus discarded, its place being taken by the boomerang and the pitchi. It is also logical to suppose that the natives would come across patches of consolidated sand and harder soils, or in attacking ant-hills, they would then revert to the yam-stick. Eventually the two—yam-stick and the pitchi—were combined in the shovel. This is not a solitary phenomenon in Australia, for several other multi-purpose implements are known to have been invented by the nomadic aborigines. One notable example is the spearthrower-pitchi-adze-firesaw of the Central Australian people.

In the case of the pitchi and yam-stick the result of the amalgamation was an instrument not unlike the European spade. In each of the spades now available for study, the blade is like a shallow, rather elongated spoon, many times longer than wide. The cutting edge is somewhat sharper than the rest of the bowl. The handle, which is carved in one piece with the blade, is of varying lengths in all the known specimens, but in each case is much longer than the blade. It is rounded in section, and in all cases but two, terminates in a blunt point. The shape of the handle is continued, rib-like, for a little distance along the centre of the inner face of the blade, and then finished off level with the surface of this latter in a very pleasing and workman-like manner, at the same time reinforcing it. In all known examples but two, the entire surface of the implement bears that regular pitting so characteristic of the old, stone-tool made weapons and implements from the Darling River basin.

Major Mitchell was the first to mention these spades (1838) which he found to be commonly used by the natives "of the interior" (Vol. 2, p. 350). Writing about "the aboriginal inhabitants of the banks of the Bogan" (Vol. 1, p. 335-6), he states that the children of these people subsisted chiefly on the roots of a small chikoraceous plant called by them tao; "as soon almost as they can walk, a little wooden shovel is put into their hands, and they learn thus early to pick about the ground for those roots and a few others, or to dig out the larvæ of ant-hills".

He further mentions that amongst the things the women of these people had to carry were "small boomerangs and shovels for the children's amusement". (Vol. 1, p. 337.)

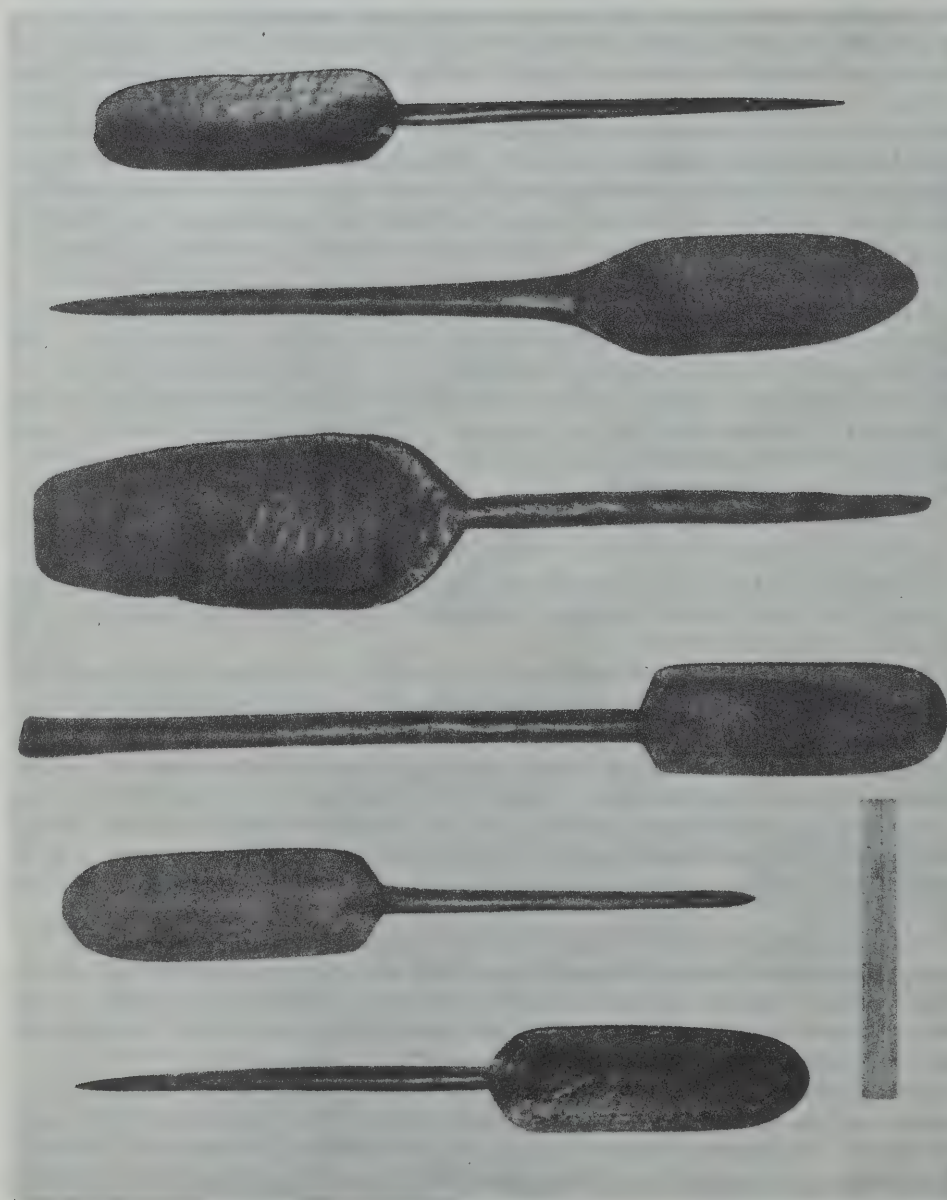
He observed that the shovel's handle was used as well as the blade "with one end they dig up different roots, and with the other, break into the large ant-hills for the larvæ, which they eat". (Vol. 2, p. 350.)

Mitchell was also the first to illustrate this implement. It is carried by the native in the foreground of the illustration, but unfortunately it is not clearly delineated. (Vol. 1, plate 12, p. 194.)

On the first stage of his next, and epoch making, journey (to Portland) Mitchell camped one night not far from Goobang Creek, a tributary of the Lachlan. He states "At the camp, we recognized among the natives seated at our fire, two of our friends from the Bogan. Their little shovels of hard wood (not used on the Lachlan) and one of the tomahawks formerly distributed by us, left no room to doubt whether we were right about their features". (Vol. 2, p. 23.)

The next locality at which Mitchell mentions having seen these implements is on the Dos Casas Creek, (now known as Wallaloo Creek) a tributary of the Richardson River, about 20 miles north of Stawell, in Western Victoria. Here two natives slept by his fires and, "they contrived to steal a tomahawk, and went off leaving their wooden shovels at our camp". (Vol. 2, p. 181.)

The next reference comes from Eyre (1845) who was appointed Resident Magistrate at Moorunde, on the Murray River, South Australia, in 1841, when that Colony was barely five years old. He there had unlimited opportunities for studying native life in this district, and the results of his researches were embodied in the second volume of his work, "Journals of Expeditions of Discovery". On page 313 of this volume he advances the information that "The Karko is a small spade of wood, used by the natives north of Adelaide for digging up grubs from the ground".



From left to right : Fig. 1. Dubbo. (R. M. Wishart Collection, No. 3.) Fig. 2. Darling River. (S. R. Mitchell Collection, No. 1.) Fig. 3. Willandra Billabong. (National Museum Collection, No. 1.) Fig. 4. Lower Murray. (S. R. Mitchell Collection, No. 2.) Fig. 5. Condelohin. (A. Massola Collection, No. 1.) Fig. 6. Dubbo. (R. M. Wishart Collection, No. 1.)

Mr. H. O'Sullivan White, a Surveyor attached to the Lands Department of New South Wales, was the author of a paper entitled "Some Recollections of the Aborigines of New South Wales in the years 1848, 1849 and 1850", which was read before the Maitland Scientific Society many years ago. This paper was made available to the editors of "Mankind" and published in that Journal. (Vol. 1, 1934.) The author relates (p. 225) that he was camped on the banks of the Macquarie River, "where the town of Dubbo now stands" in 1849, when an old blackfellow belonging to a tribe who was camped nearby, happened to die. He was buried on a sand-hill about a mile from the river. After burial "They (the natives) then described a circle around the grave, taking the grave for a centre, about sixteen feet in diameter, and then, with small wooden spades made from the myall wood (used by them for grub hunting to dig along the roots of the gum trees, exposing the hole of the grub, etc.) carefully removing the earth from within the circle, and formed with it a dome shaped mound over the grave . . . Part of Dubbo must now stand where this tomb was carefully raised by the poor blacks".

Brough-Smyth (1878) does not give any additional information on the shovels, and merely repeats part of what Mitchell has stated.* However, on page 203 of the second volume of his work, is a list of place names furnished by the Surveyor-general of the Colony (of Victoria). There he gives the native name for the hill known to Europeans as South Terrick. It is Wangat, and the meaning is given as "a kind of wooden spade for digging up grubs". South Terrick is the lesser of the two hills of the Terrick Range, about 20 miles west of Echuca in Northern Victoria, and not far from the Murray.

In 1883 K. H. Bennett in describing the method used to obtain water from *Eucalyptus* roots by natives living in the country between the Lachlan and Darling Rivers stated that they removed the soil covering these roots with their wooden shovels.

The same author in a catalogue of weapons and implements which he had collected for the Australian Museum (1887), lists a wooden shovel "used for unearthing the lace-lizard (*Hydrosaurus*) and other reptiles, and also for uncovering the roots of *Eucalyptus* trees for the purpose of obtaining water out of them. Country between Lachlan and Darling Rivers".

Curr, (1887) in his list of Bangerang words, gives "punbors" as meaning "wooden spade". He was an authority on these tribes, having settled amongst them, at Tongala, from 1841 to 1851. Tongala is on the Goulburn River, Victoria, about 10 miles from its junction with the Murray. The Bangerang tribes, however, owned the Goulburn as far south as Toolamba, and the Murray as far east as Cobram, so that the spades must have been known at least so far afield. Whether they were used so far south and east is nevertheless open to doubt, as the soil here changes, and the digging stick comes back into its own.

In Edge-Partington's work (1890), a shovel from the British Museum's collection is figured (pl. 354, No. 181). It is stated to be "from the Murray River", and the length given as 26".

Worsnop (1897) was the next author to mention these implements, but his material is entirely derived from Mitchell, whom he appears to misquote. He states "On the Bogan River, Sir Thomas Mitchell came upon some huts, from which the natives in their terror at

* The difference in pagination in the references given by this author and the present writer is due to the fact that while the former quotes from Mitchell's 1st edition, the latter quotes from his 2nd, this being the more readily obtainable.

the first sight of white men fled, leaving their fire still burning. Here were found some hatchets, carved boomerangs, and for the first time they saw some small wooden spades or shovels". Actually the incident is narrated by Mitchell on p. 313 of Vol. 1 of his work. He there refers to ONE stone hatchet, and some carved boomerangs but makes no mention of wooden shovels.

Thorpe (1928) described and figured two of six shovels which he claims were present in the collections of the Australian Museum, without, however, giving any locality for them. One must have been that collected by Bennett "between the Lachlan and Darling". In his paper he briefly noticed the writings of former authors but appeared to accept them without criticism. For instance, he did not correct Worsnop's misquotations of Mitchell's work. Therefore he does not give the impression of having been directly familiar with Mitchell's book. Also he claimed that the distribution of the shovels was restricted to the vicinity of the Western river system of New South Wales, notably the Lachlan-Darling area, but did not give his reasons for having arrived at this conclusion.

Thorpe, however, recorded that in 1883 the former taxidermist of the Australian Museum, Mr. R. Grant, ascertained that a local name for the implement was yamma, and that Grant "saw an aboriginal using one for removing cooked meat from the fire". Unfortunately Thorpe did not give the locality visited by Grant, so that this reference is almost valueless.

The last writer to mention the shovels is G. K. Dunbar (1943). In an article "Notes on the Ngemba Tribe of the Central Darling River, Western New South Wales", he states that these people were numerous on Yanda Station which was situated below Bourke, running south from the river to the Cobar Road. While describing the domestic implements used by the Ngemba, Dunbar writes (p. 172) "The implement, which I call a grub-shovel, was cut out of the living tree, and must have been a task with stone tools, because the blade was twelve to fourteen inches long by six inches wide, and the handle two feet longer. It was shaped like a paddle, and made by the men for use by the women to dig out grubs and other foods from the ground".

In this paper Dunbar gives a sketch of one of these implements, and from it we see that here they did not differ in any way from those held in our collections.

This last completes the list of the authors who have investigated the wooden shovels of south-eastern Australia. As can be seen the material is scanty, yet there is enough to extend the limits of the use of this implement considerably beyond the Bogan. The present writer has no doubt that in Mitchell's time the shovels were not in use on the Lachlan. But that author's mention of the two Bogan men at his campfire, amongst Lachlan blacks, means that it would only be a matter of time till these latter realized the tool's usefulness and adopted it. They did occur on the Lachlan at a later date, as at least four of the extant specimens were collected there. Already, before Mitchell's time the shovels must have travelled the length of the Darling and across the Murray for him to see them on the Dos Casas.

The appended map pinpoints all the localities mentioned by former writers, and those from which the localized implements at the author's disposal were obtained. An idea of their former distribution can thus be formulated. It will be noted that the two references "North of Adelaide" and "Country between Darling and Lachlan" are not pinpointed on the map, as they are too vague.

CATALOGUE OF THE NATIVE SHOVELS HELD IN MUSEUMS AND BY SOME PRIVATE COLLECTORS IN SOUTH-EASTERN AUSTRALIA

South Australian Museum, Adelaide

1. Blade $3\frac{1}{2}$ by 8 inches. Handle 17 inches. One side of blade worn down to 7 inches. Lake Cobham, N.S.W., an old, well-worn specimen (Reg. No. A6391).

National Museum of Victoria, Melbourne

1. Blade $4\frac{1}{2}$ by 12 inches. Handle 24 inches. In this specimen the handle swells out towards the distal end from the blade and is there abruptly cut off. There never was a point on it. The registration book states that it was "Made by aborigines living on the banks of Willandra Billabong, between Mossgiel and Lachlan River, N.S.W." (Reg. No. 31842.) (See pl. P, fig. 3.)

2. Blade 15 by 4 inches. Handle $18\frac{1}{2}$ inches. No locality. Cutting edge of blade blackened by fire. (Reg. No. 43736).

3. Blade 13 by $4\frac{1}{2}$ inches. Handle 21 inches. No locality. Cutting edge of blade well worn. (Reg. No. 48158).

S. R. Mitchell Collection, Frankston, Victoria

1. Blade $12\frac{1}{2}$ by 4 inches. Handle 15 inches. Darling River. (See pl. P, fig. 2.)

2. Blade 17 by $6\frac{1}{2}$ inches. Handle 18 inches. Lower Murray. This is by far the heaviest shovel known to the present writer, and the only one made of red gum. This specimen lacks the characteristic western N.S.W. "Tooling". (See pl. P, fig. 4.)

F. Smith Collection, Mt. Dandenong, Victoria

1. Blade 13 by $3\frac{1}{2}$ inches. Handle $18\frac{1}{2}$ inches. No locality.

2. Blade 13 by 5 inches. Handle 22 inches. No locality.

R. M. Wishart Collection, Kew, Victoria

1. Blade 13 by 6 inches. Handle 26 inches. Formerly in the A.S. Kenyon Collection. No locality.

2. Blade $12\frac{1}{2}$ by 4 inches. Handle 16 inches. Dubbo, N.S.W. (See pl. P, fig. 6.)

3. Blade 12 by $3\frac{1}{2}$ inches. Handle 18 inches. Dubbo, N.S.W. (See pl. P, fig. 1.)

4. Blade 11 by 4 inches. Handle 17 inches. No locality. The blade of this specimen has been scorched and blackened by fire.

A. Massola Collection, Montrose, Victoria

1. Blade $11\frac{1}{2}$ by $4\frac{1}{2}$ inches. Handle $22\frac{1}{2}$ inches. Inscription on back of blade reads "Native spade (Kyaag) Condobolin, Lachlan River, N.S.W." Formerly in the E. Young Collection. This shovel does not bear the characteristic tooling of western N.S.W. (See pl. P, fig. 5.)

2. Blade 13 by $4\frac{1}{2}$ inches. Handle 21 inches. No locality. Formerly in the F. Smith Collection. The cutting edge of the blade in this specimen is blackened by fire and well worn.

The Australian Museum Sydney

1. Overall measurements, length $28\frac{1}{2}$ inches, width 6 inches. This is the specimen with a crutch handle, illustrated by Thorpe in Rec. Aust. Mus. xvi, pl. 28, fig. 1. It is referred to as a "Yamma", from the Lachlan River (Reg. No. E28274).

2. Overall measurements, length 43 inches, width $3\frac{1}{2}$ inches. Described and illustrated in above paper, fig. 2. This is also a Yamma, from the Lachlan River. (Reg. No. E28273).

3. Blade $14\frac{1}{2}$ inches by $4\frac{1}{2}$ inches. Handle 20 inches. The handle in this specimen is polished and the blade tooled. This shovel was purchased from K. H. Bennett, and is the one mentioned by him as obtained between the Lachlan and Darling Rivers. (Reg. No. B8522).

4. Blade $12\frac{1}{2}$ inches by 5 inches. Handle 20 inches. From the G. Stacey Collection, between Lachlan and Darling Rivers. (Reg. No. E24439).

5. Blade 15 inches by 5 inches. Handle 21 inches. This specimen has the characteristic tooling. From Caronga Park Station, Byrock. (Reg. No. 16172).

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DISTRIBUTION

Locality	Mentioned in Literature by	Extant Specimens
<i>Macquarie River, N.S.W.</i>		
Dubbo	O'Sullivan White	Wishart (2)
<i>Bogan River, N.S.W.</i>		
Byrock	Major Mitchell	Aust. Mus. (1)
<i>Darling River, N.S.W.</i>		
Yanda	Dunbar	S. R. Mitchell (1)
<i>Lachlan River, N.S.W.</i>		
Condoblin		Aust. Mus. (2)
Willandra Billabong		Massola (1)
Country between the two former Rivers	Bennett	Nat. Mus. Vic. (1)
<i>Lake Cobham, N.S.W.</i>		
(West of the Paroo River, North of Broken Hill.)		Aust. Mus. (2)
<i>Murray River, Victoria</i>		
Terrick Ranges	Brough Smyth	S. Aust. Mus. (1)
<i>Goulburn River</i>		
Tongala	Curr	
<i>Dos Casas, Victoria</i>		
(Wallaloo Creek, a tributary of the Richardson River.)	Major Mitchell	
<i>Murray River</i>	Edge Partington	
<i>Murray River, S.A.</i>		
North of Adelaide	Eyre	S. R. Mitchell (1)
No Locality		Nat. Mus. (2)
		Smith (2)
		Wishart (2)
		Massola (1)

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A. MASSOLA.

Australia : Archæology.**McCarthy**

Methods and Scope of Australian Archæology. By *Frederick D. McCarthy, Dip.Anthr. (Syd.)*, Curator of Anthropology, Australian Museum.¹

Field studies in archæology are not advanced to the same degree in Australia as field studies of social anthropology, even though archæology has been pursued on a large scale in other parts of the world for over a century. Courses in social and applied anthropology are given at the universities in Sydney and Perth, and courses in ancient archæology (middle east and oriental) in most of the Australian universities. Only one, in Melbourne, is presenting a course in Australian and Oceanic archæology. No actual training in field methods is given anywhere. Archæology is a non-career course, as there are no jobs in the universities for students who wish to specialize in archæology, particularly of Australia and Oceania, and the only positions open to them are those which crop up once in a decade or more as anthropologists in our state museums. There are no funds in Australia to finance excavations, and work of this kind, therefore, has been carried out on a very minor scale. It is highly desirable that our universities give courses on the archæology of Australia and Oceania, and that they use local sites to train students in field techniques, even if their field research as graduates has to be financed from abroad, where their future positions as professional archæologists lie. They can, nevertheless, do a lot of valuable work in Australia as leaders of organized amateur groups.

The constant description and illustration of archæological excavations and finds in the newspapers and magazines, on the radio and television, have accentuated and built up considerable public interest in the origins of human races and cultures, in the way the extinct peoples and civilizations lived, and in their arts and crafts. Books describing large scale archæological work are now best sellers in the non-fiction field. Australia lacks the spectacular archæological background of Europe, Asia and the Americas, but its very paucity, and its association with one of the world's living archaic people, give us strong reasons to exploit its possibilities and the contribution to knowledge that it will ultimately make.

The few excavations done in Australia have yielded important data on the antiquity of the Aborigines and on the changes in their implements. The Kartan culture has been excavated from old land levels some 10,000 years old in South Australia (Tindale), the Tartanga-Devon Downs sites (Hale and Tindale, 1930) revealed an occupation of 8,700 years from the present time (Tindale, 1957) at the moment classified into five cultural periods named the Tartangan, Pre-Pirrian, Pirrian, Mudukian and Murundian. In Victoria dates from 1,000 to 13,800 have been obtained from various prehistoric sites by Gill (1955). These dates are those yielded by carbon 14 tests. In New South Wales the Lapstone Creek site (McCarthy, 1948) yielded two periods, the Bondaian and Eloueran, whilst in Arnhem Land (Setzler and McCarthy, 1950, 1959) three cultures, the Pirrian, Milingimbian and Oenpelian, were defined. It is obvious that excavations and datings are required from a much wider range of localities before a proper understanding of Australia's archæological history is gained. It has been shown (McCarthy, 1940, 1955) that our pre-history is linked with that of Melanesia, Indonesia and South-east Asia from the late Pleistocene to the Bronze periods, whilst in Arnhem Land and Cape York it extended down to this century. A full discussion of Australia's archæology will be found in various papers cited in the list of references.

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Knowledge of the archæological history of the Australian Aborigines is much less than that of other aspects of their culture, and it is most important that this gap in our knowledge be filled. The aim and purpose of archæological work in this country is (1) to reveal the types of stone, bone, shell and other artifacts used by the Aborigines throughout their occupation of the continent; (2) to define the industries and culture periods to which they belong and to establish the relative antiquity of each of these periods; (3) to provide skeletal material for studies in the comparative anatomy of the Aborigines from the earliest times to the present; (4) to record all kinds of relics in situ, such as rock engravings and paintings, stone arrangements and carved trees; (5) to map the location of all surface campsites, workshops, middens and cave deposits; (6) to establish the typology of the stone, bone and shell implements of Australia; (7) to establish the distributions of specialized types of implements.

Real progress of archæology in Australia will probably depend upon co-operation between the few professional anthropologists in the museums and universities and the interested amateur. In Great Britain many archæological societies exist whose members carry out excavations, or assist museums and universities in this work. The implements and records are deposited in museums. In South Africa permits must be obtained from the Commission for the Preservation of Natural and Historical Monuments by people who wish to excavate prehistoric sites to ensure that the work is done scientifically and that the specimens and records are preserved permanently in a responsible institution. In New Zealand valuable archæological work is being done in this way on sites ranging from those of the Moa-hunter period which began about a thousand years ago, to recent Maori villages, fortresses and other places. The collections from these excavations are placed in the museums for permanent preservation and reference. The people carrying out the work are linked together as members of the Archæological Association of New Zealand. In Australia this link exists in the various State anthropological societies, which have always been interested in this field of research, shown by the numerous papers on the subject issued in their journal *Mankind*, and lectures on it to their meetings. Groups from this Society excavated sites in 1930 (Thorpe, 1931, 1932) and 1936 (McCarthy, 1948). The time is now opportune to form archæological groups or sections in these State societies. There is a growing interest in archæology in Australia, one that could be stimulated considerably by an active programme of fieldwork. It is of vital importance that, should amateurs embark on such a project, they do the work properly, so that the maximum scientific data will be obtained and the collections and records deposited in museums or universities. To ransack prehistoric sites for specimens is a crime against science and history, and one which destroys valuable and unique data forever. It is advisable for interested people to report sites to the local museum or university so that a record of such sites may be recorded for future investigation. Each museum has, in its turn, an obligation to maintain a card catalogue of archæological sites in its State, and a list of these should be published every ten years or so.

It is vitally important that the people engaged in excavation work should familiarize themselves with the range of stone, bone, and shell implements and ornaments, and other articles likely to be unearthed, and with the literature on the subject. We have in Australia a standard classification (McCarthy, Bramell and Noone, *Stone Implements of Australia*, Aust. Mus. Me. ix, 1946) of the stone implements of the continent, and examples of them

are on display in our museums. Specimens of key importance may be overlooked if the excavators are inadequately informed about the industries and cultures upon which they are working.

In the following pages is given a brief description of methods suitable for recording archaeological sites in Australia. It is not a discussion of method, but rather an adaptation of standard techniques to Australian sites.

EXCAVATIONS

The need for accuracy in this work is essential because from the moment digging starts, the deposit is removed and cannot be replaced. If a proper record is not kept of this displacement of material and implements then time and labour are wasted and valuable scientific data is destroyed. It need hardly be stressed how important is accurate recording in deposits containing material of an unique character, those in remote places, or in localities where only one site is excavated during a long period of time. A serious responsibility is thus placed upon excavators who must not only note every item of information about and yielded by a site, but keep records that will verify the findings. The data yielded by a site on the environment of the people or peoples who occupied it, their means of subsistence and way of life, their implements and art, and about the climate, fauna and flora of the area at different periods of time, all contribute to an understanding of their cultural status in a country as a whole.

The sites suitable for excavation in Australia comprise shell and ash middens, both in the open and in rock shelters, and graves. There are no buildings or major earthworks of any kind, and simple standards of excavation, which meet with the necessary requirements of accuracy and recording of data, are all that are needed. The value of an excavation lies in the real contribution it makes to knowledge about a country's past. It is vandalism of the worst type to dig out a prehistoric deposit merely to get a bagful of implements for a private collection. For this reason, it is perhaps very fortunate for archaeology in Australia that there are no commercially valuable articles, like greenstones in New Zealand, ornaments of precious metals and stones like those found in the Americas and other countries, or Bronze Age material, to spur collectors on to exploit sites for their own selfish and mercenary purposes.

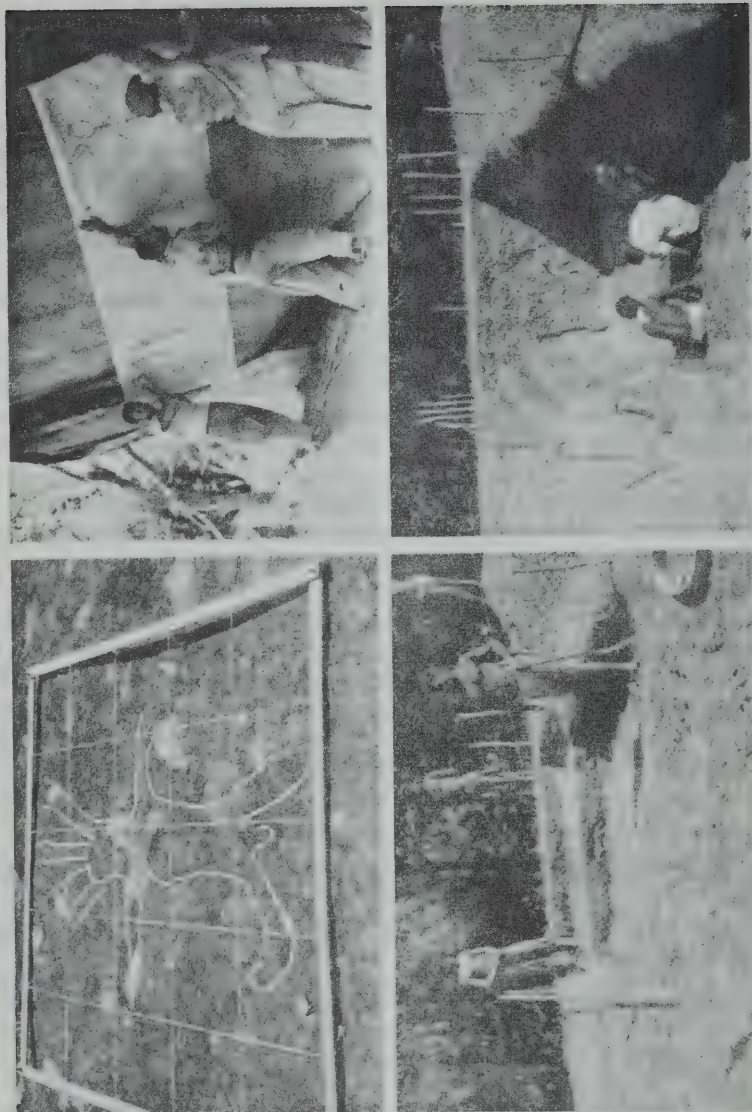
Equipment

Level (Abney, Cowley or similar type), and depth-staff (marked in black and white bands 6 inches wide).

Hand trowels, small pick, small fork, 4 inch paint brush, dust-pans, buckets, shovels, and wheelbarrow (if necessary).

Notebook, diary, site register, pens and pencils, marking ink, maps, coloured pencils, 50 ft. steel or metallic tape, 6 ft. steel measures, ball of cord (for subsidiary datum lines).

Sieves: $\frac{1}{8}$ inch wire mesh is suitable for most purposes. The ordinary circular sieve is handy for auxiliary use. A rectangular sieve about 30×18 inches in size can be built on a frame to support the weight to be sifted so that the operator merely shakes the sieve and empties it after extracting the finds. A large rectangular fixed sieve, up to 6×3 feet in size, can be set on a sloping frame, the midden material being thrown against the top and the finds slide to the bottom. Sieves should be made to allow dismantling for transport.



Top left : Use of flat frame 5 feet square (and compass) in recording 60 scale-moulded rock engraving of a man in the Sydney-Hawkesbury district of New South Wales. Photo, author.

Top right : Tracing rock engravings at a site in the Lermius reservoir area on the Kaevalh River in California as part of the Inter-Agency Archaeological Salvage Programme in the United States. From *Archeology*, Spring, 1951.

Bottom : Two views of the excavation of a shell midden at Milingimbi by Setzler (United States National Museum) and the author as part of the archaeological work carried out by the American-Australian Arnhem Land Expedition in 1948, showing the bigged-out trench area and early use of shovels and sieves, and travelling out of the deposit at a later stage. Photo, author.

Set of pegs 1 foot long, and stakes 3 feet long, painted white. 50 to 200 cloth bags in various sizes, such as 6×4 , 6×9 , 9×12 inches. Also supply of labels. Spirit level, compass, photographic equipment with scale rule.

Location of site.

The site is marked on a military or other reliable map. A scale diagram is then prepared of the locality, relating the site to roads, railway lines, rivers, creeks, coast, range and other features of the area. For publication, the location is marked on a map of a State or country also to enable people unfamiliar with the area to see at a glance where it is situated.

Contour Map

A bench or zero mark, is established by a mark on a tree or rock, otherwise a stout peg, which will not be disturbed in the course of the work. From this mark readings are taken for a contour map, particularly for open shell middens and ash heaps, and in some rock shelters. The readings are taken with the level at regular intervals along the selected contours, the points are plotted and joined up to form the contour lines. The zero-mark should be outside a rock shelter and in a position from which contours of the front slope of the deposit may be mapped. It may be established at a point in the datum line.

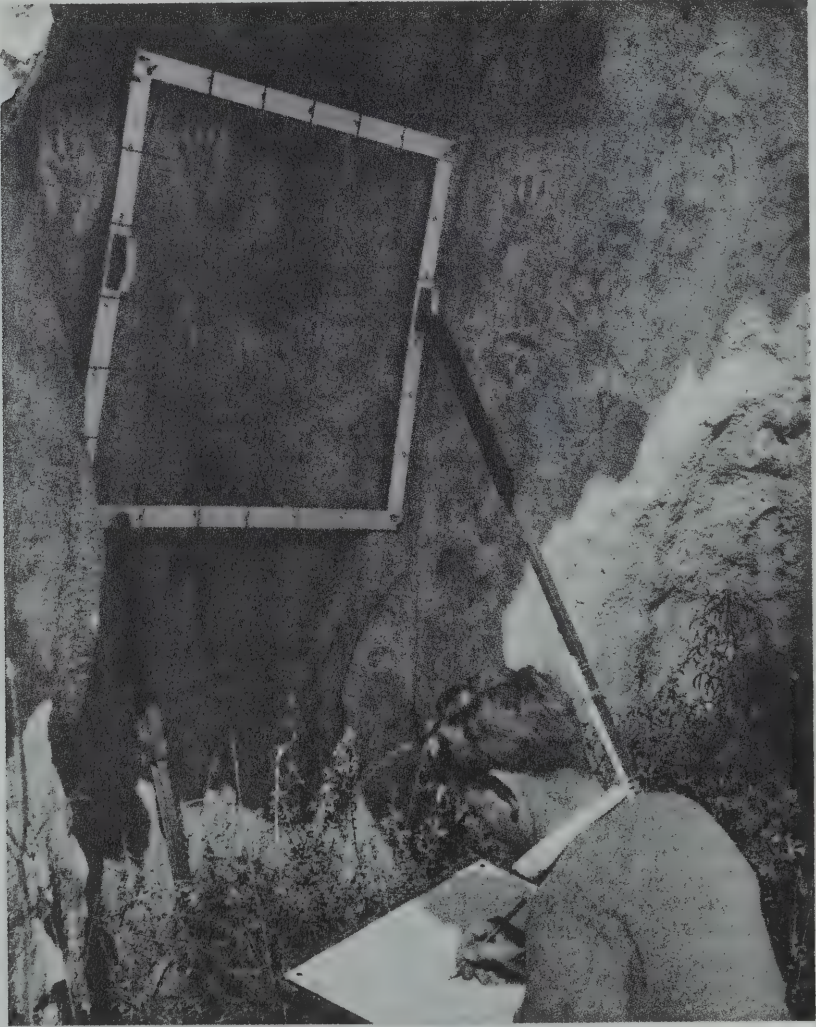
Setting out the site

The next step is to prepare a scale plan of the cave or midden, and of the area to be excavated. A steel or other tape is set across the deposit as a base or datum line, preferably just outside or at the edge of the deposit, from north to south, or from east to west, depending upon the position of the site. In a rock-shelter the points at which a secondary and central base line begin and end may be marked on the wall and plan as a guide to future excavators. The outline of the wall, where it joins the deposit, is sketched in by measuring from the datum line to the wall at chosen points. In the same way the edge of the roof, the drip line, and the outer edge of the deposit, are established. With open middens the outlines are shown on the contour maps.

The section to be excavated is now set out in numbered squares, at right angles to the datum line, marking the squares in two parallel rows where a trench 6 to 9 feet wide is to be dug or in as many rows as necessary where a greater area, such as a sector or half of an open midden or rock shelter floor, is to be dug. The squares may be 2, 3, 4, 5, or 6 feet in size, 3 or 4 feet being a convenient width face for one man to work. Squares from 4 to 6 feet in size are satisfactory in shell middens where implements are scanty. The squares are defined by wires or cords stretched along their boundaries, or by a peg a foot high set at each corner, the pegs being pushed down deeper as the deposit is dug away. From 1 to 2 feet outside each row, or double row, of squares, may be set a line of 3 ft. high posts (to bear the numbers of the squares), one being placed either opposite each junction or corner, or the middle of each square. These posts must not be disturbed until the relevant section is finished.

The squares in the grid now formed are numbered in one of several ways. Each square may be given a Roman number or a capital letter, so that it is referred to as I or A, and onwards, or two sides of the section are numbered with capital and lower case letters and a square is referred to as Aa, Ad, and so on. Where necessary for plotting a grave or

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Mr. J. Beeman, Artist at the Australian Museum, recording cave paintings with a flexible frame that he devised, using the same principle as the flat frame the author developed for recording rock engravings. The grid shown above is made of three-ply, which can be bent to fit into the curves of a wall. The strings are six inches apart. The length of the supports is adjustable in the same manner as a camera tripod. If necessary, additional sticks may be used to hold the grid in place. In extensive sites the grid is moved across the rock surface in relation to a datum line, set from north to south, or east to west, according to the position of the cave.

Photo.—H. Hughes, Australian Museum.

important specimens, a square may be further subdivided into smaller squares ; for example, in a series of 1 to 9 in a 3×3 foot square. Precise measurements to establish the exact position of a grave or other important find in a square are made from the marked posts, or from the corner pegs.

All numbered finds are referred to a layer and to their exact position in a square. The knapped implements as a whole, and specialized implements which occur throughout a square or deposit, are simply recorded in squares and layers. It is unnecessary to give a number to each of hundreds of the two latter groups of implements (points being an example, as they are often found in large numbers) in a deposit, and it also involves an unnecessary waste of time. It is a matter of common sense and discretion to decide which implements will be given a number. The positions of a single or several specialized implements in a square are denoted exactly because they may represent the margin of an industry or culture.

There is, in addition, the depth of specimens to be recorded. This can be done in various ways. Where the surface of a deposit is reasonably level it may be used as a datum line for measuring depths, as it will be shown on all cross sections. Where it is too uneven or sloping for the purpose, and with nearly all open sites, a cord or wire is stretched between posts, through the middle of the section being worked, to form a horizontal datum line, established with the aid of a spirit level. A measure is then run down vertically from it to a stick held horizontally at the depth of the specimen. In a cave a datum line can be marked on the wall for this purpose. Readings with a level may be taken from the bench of zero mark (or from secondary bench marks related to the original zero one) to a depth staff. Depth can also be measured from a line of marks on the numbered posts or corner pegs.

The site is now set out to scale on graph paper, half an inch or an inch to the foot being convenient scales for most sites, and the excavator is equipped to record the position and depth of all specimens found. The digging may therefore be started.

Excavating

The method of excavating will depend to a certain extent upon the nature of the deposit, and this will be indicated by the test trench. Where a great deal of deposit containing few specimens has to be removed it can be shovelled into the sieves, a common practice in test trenches. Sound teamwork is necessary with this way of digging to keep a proper record of where specimens are found, particularly if a rare one turns up in the sieve and for this reason a limited amount of deposit should be sieved at a time. There is another serious drawback to this method. Experience has taught me that it is a mistake to hurry through an excavation. There must be ample time to pause and consider various aspects of the work, to record data and to do the manual work involved. The spade and sieve method betokens haste, layers are likely to be missed and in a 6 inch layer it becomes impossible to decide whether a specimen came from the top, middle or bottom.

The most accurate method is with the trowel. As the deposit is trowelled into the hand or into a dust-pan, all specimens are extracted as the work proceeds, and to ensure specimens not being missed the material may also be sieved.

A test trench is usually dug and marked on the plan. It may be in a convenient position from which to operate in the main excavation by working from one side of it, or by digging another trench at right angles. The excavation may start at the front of the

METHODS AND SCOPE OF AUSTRALIAN ARCHÆOLOGY.

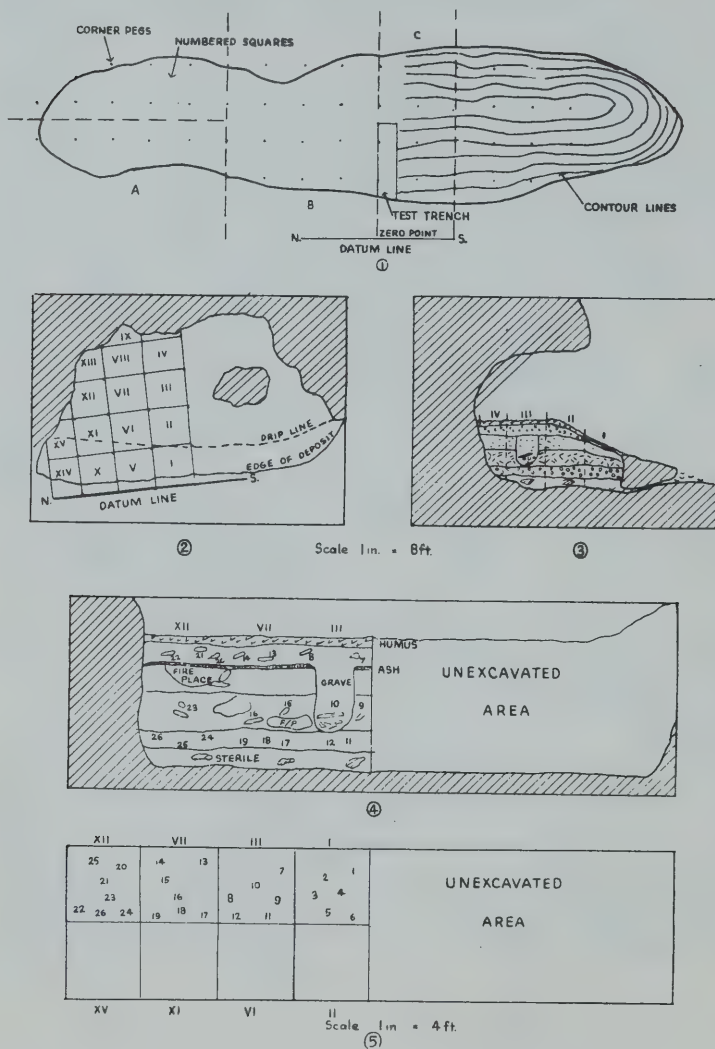


Fig. 1.—Midden or mound showing contour lines on right. The dots indicate the corner pegs of the squares. The broken lines illustrate various ways of excavating such a site, either by a narrow or wide trench through the midden, or by the removal of a section at one end.

Fig. 2.—The squared-out area to be excavated in a rock shelter floor.

Fig. 3.—Section through the deposit showing layers.

Fig. 4.—Detail of a section showing positions of numbered finds, fireplaces and a grave.

Fig. 5.—Horizontal plan showing positions of numbered finds.

deposit and work through it to the back wall. A working face 8 or 9 feet long is begun by excavating the necessary number of 4 or 5 foot squares in succession, layer by layer, each one being a check on the preceding one's results. The test trench, or these initial squares, will indicate the probable stratification of the deposit, perhaps of the industries or cultures present. The squares are removed one at a time, or if sufficient labour is available the two end ones of three may be dug first and the middle one last, along a 9 foot face. The working of the face may thus be varied to suit the conditions. The layers removed may vary from 3 to 6 inches in thickness in ashy-soil deposits, preferably of 3 inches and of 6 inches or one foot in shell middens, their thickness depending upon the yield of specimens. Thin layers are removed where specimens are abundant as they give a more accurate picture of associations of implements and industries. Thicker layers are removed where implements are scanty. The stratified layers are always followed, but a thick stratum has to be taken off in several layers. Where a change of implements is revealed as the excavation gets deeper, then the thickness of the layer being removed should be reduced to conform with the change in implements. Layers of 2 to 3 inches are removed in shallow deposits to ascertain whether stratification is present. The occurrence and nature of layers, irrespective of their thickness, can be just as important as specimens because they may indicate changes in climate, fauna and flora. In some deposits, like Lapstone Creek, New South Wales (McCarthy, 1948) there may be an important change in implement types but none in the composition of the deposit. Caves like those on the lower Murray river, where the deposits consist of a hard matrix up to 20 feet deep, and other sites presenting unusual features, should be left to a team led by a professional archaeologist. It is a general practice to step back the sides of a trench in a deep deposit to prevent their collapse. Thus a working face 6 ft. wide, stepped back 1 foot in every yard, is narrowed down to a face 2 feet wide in a distance of 9 feet. The steps are not walked on at all, as this causes them to collapse. Very loose and sandy deposits are faced with boards, sheets of iron, masonite or bark to hold them in place.

The layers shown by ash or different coloured soils, perhaps by one or more species of shells, will be roughly horizontal in a cave floor but will run downwards in the front slope of the deposit. Careful judgment should be used in interpreting the cross-section revealed and comparing it with that in the test hole or trench. The strata present are then followed through the excavation as closely as possible. In an open site the stratified layers may be similar to those in caves, level in the middle and sloping on the sides, or they may all follow the slope of a ridge or hill on which the site is located. The strata are named or numbered, and defined by the conventional signs—dots, v's, crosses, etc.—used in geology, geography and soil studies. They should be progressively described and recorded as the excavation proceeds, and coloured pencils are handy to use for this purpose in the field notebook.

Care should be taken not to allow material from an upper layer to become mixed with that of a lower layer. Some excavators work from the bottom upwards in a firm deposit, teasing the material out in 4 to 6 inch blocks from bed rock to humus. The sides of the trenches and squares should be kept as clean and straight as possible, the tendency being to slope them outwards instead of keeping them flat and vertical.

The general run of implements from each layer of each square are placed in a bag when taken from the deposit or sieve. Care is needed to ensure that specimens from trimmings

are assigned to the right layer and bag ; any pieces in doubt should be discarded, if kept they may confuse the final classification of the layers and industries. All of the important or exceptional specimens are numbered and their position recorded before bagging. Only one bag is left open in a square at a time, and closed when a layer is finished. A label is placed inside each bag, and one tied on the outside to save unnecessary opening of bags to identify the contents. Fragile specimens, such as bone and shell implements, or small and thin stone ones, and those bearing incised or painted marks, are placed in labelled tins or boxes, and then either in the proper bag or with the latter in a box or carton. The numbering system for specimens may be A1, etc., for stone, B1 for bone, C1 for shell, and so on, or it may be inclusive in one numerical series for all types of specimens recovered. The data about each numbered specimen, as it is found, is entered in a field notebook on the site, and in the evening this information is entered in the site register. The latter is an inventory of finds in which there are columns for the number, type, material, horizontal and vertical positions, stratified layer, and any other remarks, of each numbered specimen entered under its square reference. On no account must specimens be left unbagged or unnumbered for later attention ; this neglect leads to confusion and loss of valuable data. Should time permit in the evening, washing and re-sorting of specimens may be done, and the group excavating should take the opportunity of inspecting their finds for the day while the leader makes his notes on their cultural implications.

Cross section drawings are made at various stages of the work, preferably in a book of graph paper to protect them. Should there be stratified layers in the deposit, a cross section may be made where a series of important specimens occur and at the front of each line of squares, from the top to the bottom of the deposit, indicating the position of the layers, specimens, outline of a grave and its contents, fireplace, ash band, animal and other holes, blocks of stone, the line of the bedding stratum or rock bottom, and any other interesting features of the deposit.

A careful watch is kept for animal holes, graves, holes dug by campers, or other disturbances of the deposit. Their outlines are recorded in the cross-section charts, and their position shown on the horizontal plan of the site. A grave is usually dug from one level of occupation downwards, often into another level of occupation, and an important fact to establish is the level at which the grave was started. Thus implements found near a skeleton or in a grave are bagged separately. They are not necessarily associated with the skeleton, because the infilling may form a mixture of levels from top to bottom of a grave. Excavating a grave is one of the most difficult tasks facing the excavator. It should be isolated on a block of deposit by excavating all round it with a trowel, brush and if necessary a pair of bellows. The orientation of the skeleton, positions of the bones and associated implements, are recorded by photographs (and drawings if necessary for clarity) from various angles. The skeleton is removed if in good condition, but it may be necessary to spray the bones with shellac, gelatine or a similar fixative to harden them before removal. Bones sometimes harden upon exposure, at other times they crumble and cannot be touched unless treated. With bones of exceptional value the block of deposit containing them may have to be encased in plaster-of-paris and bandages soaked in it to enable the whole block and bones to be removed for laboratory treatment. Graves and fireplaces may be isolated

on blocks of deposit until they are photographed and recorded, and usually until the excavation is completed, to give the excavator a realistic picture of the over-all lay-out of the site.

General practice for the excavator is to keep a daily diary and to draft interim reports of the work every few days in which provisional impressions, problems and conclusions are discussed and noted as they arise. Observations from the field notebook are also correlated, so that a progressive picture of the work and its results is built up as the work proceeds. A complete photographic record is kept, with a clear scale shown in each picture, of the site and its excavation, and of all important finds *in situ*.

The whole deposit is not excavated unless it is a very small one, likely to be dug out by collectors or be destroyed by building or similar operations. Half or more of the deposit is left for future investigation. This untouched portion is a valuable reference deposit should a site contain important cultural layers and evidence, and it is always available for a subsequent excavation employing new techniques of digging and dating. It is a common practice to cover this unexcavated portion of a deposit with stones or to fence it in for protection. A team of four is a good working unit, with 2 trowelling, one sieving, and one recording. From one to three cubic yards of deposit, depending upon the yield of specimens, can be removed by a team of this kind in a day. A large kitchen midden may take a month or more of continuous work, and it may be necessary to spread the excavation over several seasons or periods.

Dating Methods

Excavation of stratified deposits establishes the sequence of industries and cultures of the people who occupied a site in prehistoric times. One of the most important indices of cultural change, pottery, is absent from Australia (apart from the recent depot sites of the Indonesians in Arnhem Land and adjacent areas). Dating methods are discussed in detail by Heizer (1953), Miss Harding (1955) and Golson (1955), to whose papers the reader is referred. The nature of a deposit is of practical value in dating. It may be identified as part of an ancient lake or coastal shore, a river terrace, or belong to a definite climatic period indicated by its sandy, clayey or other composition. Fossils in a deposit may be linked with those of another deposit of known stratigraphical provenance.

A method used widely in the south-western United States, where it was developed by Dr. Douglass, is that of dendrochronology, in which the rings of trees growing in or top of a prehistoric deposit are counted, and correlated with those of trees growing nearby or with pieces of man-shaped wood in the deposit. There are technical problems involved in this method, and the advice of an expert botanist should be obtained to ensure accuracy in its application.

Three tests in use nowadays have yielded results that have simplified the task of the archæologist and removed one of his greatest problems, that of the antiquity of a culture or deposit, and in some instances of a single specimen. One of these tests measures the amount of fluorine in a bone. This test has been used successfully by Oakley and Montagu (1949) for dating the Galley Hill skull, and by Wiener, Oakley and Le Gros Clark (1953) in testing the Piltdown and associated fossil remains. Another test of a similar nature is measuring the amount of nitrogen in materials of various kinds (Cook and Heizer, 1947). The third method is the Carbon 14 test. In this Libby (1949, 1951, 1952) who developed the technique, recommends that 1 oz. charcoal, 2 lb. burnt bones, 2 oz. well preserved wood, grasses, cloth

or peat, shell 4 oz., be collected as samples. These are minimum figures, and bigger samples are, of course, more useful. Check samples of 3 lb. of recent shells of the same species in the same locality as the sample should also be collected. Carbon 14 tests are done in the United States of America, and in New Zealand (at a charge of up to £25 per test) but a laboratory is now being installed in Melbourne for the purpose. The greatest care has to be exercised in collecting samples from accurately identified deposits or layers. The date with a plus or minus variable, is obtained directly from the sample, and is independent of corroborative evidence from its geological or stratigraphical correlations and associations. Its range of up to 44,000 years under the best conditions, is ample, on the basis of present knowledge, to cover all prehistoric finds in Australia.

Should rock engravings or paintings be present it may be possible to associate them with one of the periods, and this, becomes a tricky problem where different periods exist in the styles or colours of the rock art. Generally speaking, where rock art is covered by deposit then the art is obviously older than or contemporaneous with the implements in that deposit. This might still be the case where they are depicted on the wall or ceiling above the floor deposit as a whole, and it is sometimes possible to link the art with one of several cultural periods in a deposit. Should there be only one culture represented then the art probably belongs to it but at what particular stage in time it may be difficult if not impossible to decide. A careful watch should be kept for ochres in a deposit to link the period of painting with a cultural period. Here it is necessary to work out the superimpositions in the colours, styles and subjects of the paintings to ascertain their cultural connections with the occupational deposits. Where a rock bearing paintings or engravings has fallen from the cave wall or ceiling, it is often possible to link it with a stratified layer because the art is obviously older than the deposit covering the rock.

Soil samples for analysis by botanists of the seeds used as food, and to indicate changes in vegetation and climate, are also taken, usually by pressing a tin or glass tube into the deposit, from each cultural layer, or from specified levels from top to bottom of the deposit. Samples of shells and bones are also collected for identification, as they indicate foods, and in some places a change from extinct to living forms.

Surface campsites present special problems. The standard practice on previously untouched sites, or upon extensive sites upon which not too much collecting has been done, is to grid the area and compare the implements from each grid to see whether the one industry is present all over a site, or whether different industries occur on portions of it thus indicating cultural changes. Where fossil bones are present important correlations may be established by a careful study of levels and surface distributions. Surface campsites and workshops usually yield a wide range of implement types, of great importance for comparison with excavated material (which is often more limited in range), and for recording distributional data. Extensive regions of Queensland, the Northern Territory, and Western Australia, and the tableland district of New South Wales, have yet to be collected in intensively for the latter purpose and until this collecting is done it will remain impossible for archæologists to plot the distributions of many of our specialized implements. Our lack of adequate distributional data is a serious deficiency in studies on the origins and distributions of techniques, types and cultures. This is perhaps the most important field for the "amateur" archæologist to exploit in Australia.

ROCK ART

The wealth of rock art in Australia demands the employment of accurate recording techniques. Many sites and areas in which there are numerous groups of engravings and paintings (or both), have yet to be recorded in detail in Australia. Herein lies a rewarding and satisfying task for interested groups of people, willing to develop and employ adequate techniques for photographing and copying complete series of figures in a single site or in a survey of the rock art of a district. There are two approaches, the purely artistic and the scientific, to the recording of a site of rock engravings or paintings. Colour photographs serve the first purpose perfectly, and are essential for lecturers nowadays, but for reasons mentioned below, they cannot in many sites be used to make a comprehensive scientific record. A skilled artist can make a scale reproduction of a group of cave paintings or drawings, but there are few artists able, interested and willing to spend the time and money involved in making a record of cave art in any particular area for scientific purposes. A complete record of a site can be made by a competent draftsman employing methods described below. The work of the Abbé Breuil in France, and of William Stow in South Africa, are wonderful examples of the invaluable recording done by men with artistic training spurred on by an intense interest in cave art. The combination of photography and drawing, however, satisfies the requirements of both approaches for recording and publication. Photographs are expensive to print in half-tone and it is usually possible to include in a paper not more than three or four such plates, the bulk of the designs have to be reproduced in line drawings. All of the tracing and drawing methods produce a record suitable for reproduction as line blocks, which are cheaper than half-tone. In recording, it is advisable to narrow wide gaps, between single or groups of figures, noting the actual distance on the chart. This decreases the size of the blocks which are charged for on the basis of size. It is important to remember, when making up plates for illustration, that the more waste space included the greater will be the reduction of the actual figures.

The recording technique to be employed depends upon the nature of the site. The X-ray paintings of Arnhem Land are extremely difficult, if not impossible, to record by drawing methods, and require photography as do other sites where the paintings and drawings occur in dense groups. Tracings and drawings should be exactly similar to the originals. Do not work with pre-conceived ideas of what a figure is, but reproduce exactly what is drawn on the rock surface. Do not attempt to improve on the outlines.

Rock Paintings

The recording of paintings in rock shelters is a difficult task. Today the use of colour photography has produced many beautiful records of paintings, but it is usually impossible to record a complete series with the camera, and other methods must be tried. From one end of Australia to the other, many sites have been defaced, even obliterated, by vandals, among whom visitors inscribing their names and dates of visit over the Aborigines' work are the most active. It is in the national interest, therefore, that full records of sites be made before vandals make this impossible. Such records could be deposited in the State Museums for permanent preservation.

Photography

While it is highly desirable to photograph the whole of a site of paintings this is rarely possible unless the site is a small one or so set out that it can be done in sections. Figures in

deep alcoves, or on a low ceiling, and faded figures, are often impossible to photograph. Important figures and groupings, portions of a site, and the colours maybe shown perfectly in photographs for which flashlight is often required. The outlines should never be touched up with chalk or charcoal for photography; this is sheer vandalism. Very often, or course, time makes it impossible to do other than take a series of photographs, and their publication, with a description of the site, forms a valuable record for later workers who wish to make more detailed studies, and for those making comparative studies of aboriginal art. The camera lens, too, reveals details that often escape the human eye, and photographs are, therefore, a most valuable and essential adjunct to the recorder.

Tracing from Photographs

Tracings can be made from photographic enlargements. This practice is sound provided the utmost care is exercised to check the pencil tracings, at the site if possible, before they are inked. Mountford (1956, Figs. 2-47), reproduces a number of plates of western Arnhem Land Cave paintings done by this method. The tracings were made in Adelaide. A comparison of his tracing on plate 34A with my photograph in Fig. 29 of my *Australian Aboriginal Rock Art*, 1958, will demonstrate the errors in shapes and line patterns which have to be carefully guarded against in all methods of drawing and tracing. In a discussion (*op. cit.*, pp. 179-81) of techniques for recording cave paintings, Mountford advocates tracing from photographs, not direct drawings on the site, to eliminate error, but it is obvious from the inaccuracies in his own work that it is usually the recorder, not the method, that is at fault whichever technique is employed. Kodachrome photographs, too, taken with flashlight and slightly underexposed, are often weak in depicting the extent of the red. Important revision is thus needed in some tracings made for black and white prints. An excellent method of tracing from photographs is to project the negative through an enlarger and trace from the image. A 35 mm. standard reading apparatus serves the purpose perfectly for this type of film.

Drawing

An accurate scale chart can be prepared by drawing on either graph paper, or on transparent paper over graph paper, from a grid frame set over the paintings. The Australian Museum employs a flexible grid which fits against either flat or curved walls and ceilings. Should the painted surface be reasonably flat, a larger flat grid, of the type used for rock engravings, may be employed. In this method the outlines and interior line patterns of the figures are drawn in from grid-line to grid-line. Each figure is carefully checked at the site. Drawings, unless the greatest care is taken to make them accurate representations, are of no value. The use of the grid frame eliminates most of the looseness to be seen in freehand sketches.

Tracing

Thin transparent paper such as cellophane, or any light tracing paper (not cloth) in large sheets, may be used to trace paintings and drawings. It is quite difficult to make satisfactory tracings particularly in deep alcoves and on rough rock surfaces. Use a soft 2 or 3B pencil or craton as it is less likely to tear or cut the paper, and do not use an indelible pencil. Tracing produces a life size series of figures which have to be reduced by

photography to a size suitable for reproduction in a paper. The famous paintings at Tassili, in the Sahara desert, were traced in life size. The colour of the rock was then painted on specially large sheets of paper, the outlines of the figures traced on to them, and the original colours painted in at the various sites. Thousands of paintings were done in this way, in series, the whole job taking two teams of artists, led by Henri Lhote, sixteen months to complete.

Superimpositions

A very important aspect of the recorder's task, and one to which little attention has been given in Australia hitherto, is to work out the superimpositions of the colours and styles (for a list of styles see McCarthy, 1958, pp. 33-34). I have shown (1955) that in the Groote and Chasm Islands caves an early period of dark red, yellow and other coloured paintings of human and animal subjects was followed by a bright red period in which men fishing from dugout canoes was a favourite subject; further, that in western Arnhem Land, a study of the superimpositions (1959) revealed that an early art of outline, striped, and monotone figures was followed by the stick-figure or Mimi style of human figures, and then by the X-ray art. In eastern New South Wales (McCarthy, 1959a) a stencil period was followed by a red period, and then by a black or black and white period. Widespread studies of superimpositions will not only reveal the changes in colours, styles, and subjects, throughout the continent, but will also indicate the chronology of religious movements where the spirit heroes and beings or other symbolic figures, are depicted in the caves, and thus help the social anthropologist and student of comparative ethnology to understand more clearly the historic development of aboriginal cultures and religions.

ROCK ENGRAVINGS

The various methods of photography, drawing and tracing described above for recording rock paintings are all suitable for engravings. The latter, however, vary so much in size, and in the area of rock occupied by them, that the method must be varied to suit a site. The aim of the recorder should be to obtain (1) a complete record of a group or site, or (2) a full record of the groupings of figures and the full range of motifs in a site. A 35 mm. camera is ideal for the purpose, as each motif can be photographed separately. In all instances a description of the techniques employed by the aboriginal artists should be given. These are described in the author's booklet on rock art (1958), and include puncturing, pecking, and abrading techniques, of which only one may be present in a site but may have been done with different sized tools, or as many as five techniques may have been employed as I found on Depuch Island in northwestern Australia. Many of the northwestern Australian sites, and others of the pecked type, consist of numerous figures (of one or a variety of motifs) occasionally in groupings; other sites, like Panaramittee and Yunta in the Flinders Range of South Australia, Mootwingee and Sturt's Meadows in western New South Wales, display a vast range of motifs on a large number of small rock surfaces. At Port Hedland there is a continuous display of all kinds of small and large figures along low limestone ridges up to $3\frac{1}{2}$ miles long. In the Sydney-Hawkesbury district occur small numbers of comparatively large figures in each group (145 being the largest group known) from 6 to 60 feet long, often scattered over an acre or more of rock. On Depuch Island, northwestern Australia, many

hundreds of figures are engraved on almost as many rock surfaces, mostly vertical, on the boulder-strewn ridges of the island. Each of these types of sites presents a different problem to the recorder.

Photography

Both colour and black and white photographs are satisfactory for recording engravings of individual and small groups of figures, and both should be taken where possible. Where the engravings exceed three or four feet in length, distortion will give an inaccurate picture of their true proportions in a photograph. A box or ladder will enable the photographer to get sufficiently high above a figure to record it in true proportions if it is not too big, or the camera (with an accurate focussing device) can be fitted to and worked from a pole 6 or 8 feet high. A side light from the morning or afternoon sun throws enough shadow in the grooves to give sharp photographs of engravings, and will illustrate the techniques quite clearly. It is usually advisable to photograph engravings with the grooves chalked and unchalked to ensure getting a successful record of them. It is difficult to chalk in grooves accurately if the light is poor or a midday one. Uncertain grooves should be shown by broken lines.

Photographs provide an accurate record of the small groups, and of series of small figures, characteristic of the pecked engravings in the interior of Australia. Should line illustrations be required for a paper on a site, they may be traced either from a print or by any of the methods described for paintings. There are two other methods of using prints to produce black and white illustrations. One method, employed by Dr. Carl Schuster, of New York, to whom I am indebted for the details, in his studies of primitive art, reproduces a line drawing from a photographic print. The figure or design is gone over with India or waterproof ink on a somewhat under-exposed matt (not glossy) print which will bleach easily. Uncertain parts of the figure may be traced in pencil for later completion. When the ink is thoroughly dry the print is immersed in a bath made up of two solutions. One is of potassium ferricyanide and water, the other of sodium thiosulphate (i.e., plain hypo without the acid hardener) and water. The relative proportions of these ingredients are of no real importance, but the two solutions, if made into stocks, must be kept separate until use otherwise the mixed solution will deteriorate rapidly. The potassium solution may be a strong one but it is used sparingly when mixed with the hypo one. The photographic image disappears within from 3 to 5 minutes apart from any very dark or black patches which bleach out very slowly or not at all. If the print is left too long in the solution it will turn yellow but this will not actually affect the black outline of the figure. In the bath the ink softens sufficiently to allow any errors to be erased with a piece of cotton wool on the end of a toothpick. The print should be washed thoroughly in several changes of water, hung up with a wooden clamp for from 10 to 15 minutes to let the superficial water drip off and the ink to harden. It is then placed in a blotter-roll for the final flat drying. In the second method a blue-print is made from the negative, the figure inked in with India ink, and the print placed in a bath of 1 oz. of potassium oxillate in 6 oz. of water.

Drawings

The large figures of the Sydney-Hawkesbury district are best recorded with a flat grid frame, 5×5 ft. in size, on which strings mark one foot squares. This grid is moved across

the rock surface in relation to a steel or other tape set in a north to south or east to west direction according to the general lie of the group as a whole. Subsidiary lines, either parallel or at right angles to the datum line, may be used in recording extensive groups. A scale of half-inch to the foot is a convenient one. Where it is necessary to reduce the distances between figures to make the recording compact for reproduction in a paper, the directions between the figures are preserved and the footage noted on the chart. Photographs are taken where the figures are not too big, and of the heads and other features of the large figures, and a selection of these should be included in the paper.

Where engravings extend for considerable distances, like the eight miles of them at Port Hedland, the most suitable method of recording is to draw scale charts of (1) a typical assemblage or section 50 to 100 feet long; and (2) all or selected groupings which constitute compositions. Photographs are then taken of all individual designs and motifs, some of which can be used in the published report but the bulk of which will have to be reproduced in line drawings.

Rubbings

Rubbings are obtained by placing a sheet of soft or inferior paper (of average newspaper or shelving-paper quality) over the figure and rubbing lightly over its whole surface with blue carbon paper so that the figure stands out as a blank in a blue field. The rubbing is then sprayed with a fixative such as duco or shellac in petrol or methylated spirits used in an atomizer.

The Frobenius Institute of Frankfurt, Germany, uses a Japanese rice paper, which is soft and flexible and does not tear during the process, for rubbings of the actual grooves or pecked surface of the engraving. Heel ball, crayon or pencil may be used for the rubbings.

The remarkable human and animal figures among the engravings at Abydos, Woodstock and other localities in northwestern Australia, which occur either singly or in small series, on one rock, are best recorded in life size by tracings or rubbings, and they show up well in photographs.

Casts

Latex moulds may be made of rock engravings by painting the rock surface with linseed oil, and then with successive coats of latex until a thickness of $\frac{1}{16}$ to $\frac{1}{8}$ of an inch is secured. The mould is usually made one day and lifted the next day. Latex is much cleaner to use, and lighter to carry, than plaster of paris.

STONE ARRANGEMENTS

These are composed of small unshaped boulders and rocks as a rule, and consist of heaps, circles or ovals, and lines. Photographs of single or several heaps, or of elongate stones raised on end, form a sufficient record. More extensive arrangements should be drawn to scale, all individual rocks being shown if possible, a simple method being the use of a datum line and grid frame.

PRESERVATION OF ABORIGINAL RELICS

No commission or trust has been set up by any government in Australia to preserve aboriginal relics, and the only legislation enacted for the purpose applies to the Northern Territory administered by the Commonwealth Government. The Cumberland County

Council, the county in which Sydney is situated, is taking full advantage of powers within its act to protect and preserve the many aboriginal relics of the area. Rangers are not appointed in Australia to protect aboriginal relics, and it is mainly through the efforts of local people and councils that sites will be protected and preserved. Meanwhile, vandals are defacing sites, particularly paintings, all over the continent.

Occupation or prehistoric sites, such as middens in rock shelters and elsewhere, should be reported to museums or universities, and not disturbed, so that they will be available for investigation when a programme of excavation can begin in the area. There is plenty of scope in the study and collecting of implements on surface sites for the non-professional person interested in archæology. If he is prepared to learn and apply accurate techniques of excavation and recording, and to organize a team of 3 or 4 to do likewise, there is no reason why he should not begin excavating, preferably on small sites until initial technical problems are overcome, and develop the work into a survey of the archæology of an area. The records and implements should be deposited in a responsible institution for permanent reference.

Rock engravings and paintings are difficult to protect from the stupid vandal who records his visit with a metal tool, charcoal or pigment. A group of cave paintings can be seriously disfigured in a few minutes by people of this kind. Fences and notices will help to protect engravings situated in public reserves, suburbs and other places easily accessible to the public.

The damage to rock engravings caused by natural weathering agencies such as heat and cold, rain, wind-blown sand, and the deterioration of rock surfaces, has not yet been studied in Australia with a view to developing conservation measures. Most of the remedial measures commonly suggested have not been applied or tried. Surface treatments of silica and similar media have a tendency to harden and peel off thin layers of exposed sandstone bearing engravings like that in the Sydney-Hawkesbury district, but they may be more successful on the dolerite and basaltic rocks on which engravings occur in northwestern Australia and elsewhere. Paint and tar, which give a false impression of the art, will peel off in time, and are acutely affected by summer heat. The breaking up of the desert sandstone rock surfaces by natural weathering agencies at sites such as Mootwingee and Sturt's Meadows in western New South Wales, and in the Flinders Range of South Australia, could be arrested by a skilful and careful use of cement. As a very last resort perhaps, an expert stone mason could no doubt deepen the weathered outlines of important and unique figures in danger of weathering away altogether, by using puncturing and abrading techniques.

Cave paintings are most effectively protected by the erection of a heavy wire screen (Cyclone-type), fitted with a locked door, to close off the front of a rock shelter. This screen keeps out cattle, which rub paintings away, and vandals, but protection of this kind cannot be provided in remote places, or in areas like Oenpelli where hundreds of painted shelters are concentrated in a small area. Shellac, linseed oil and similar treatments will destroy the paintings. A transparent coating of calcium, that protects both rock surface and paintings, is provided by nature in limestone caves. The sandstone, however, softens and frets away, particularly in caves, destroying panels of up to 20 feet long bearing drawings and paintings in the process. Another grave problem in rock shelters is that of damp walls due to seepage, and this can only be overcome by constructing adequate drains to divert

water from the cave. In South Africa some of the outstanding and unique paintings have been removed to museums for preservation.

Stone arrangements should be fenced in to prevent cattle, horses and sheep from disarranging the stones.

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F. D. MCCARTHY.

REVIEW :

Lehrbuch der Voelkerkunde. By Dr. L. Adam and Dr. H. Trimborn, 3rd revised edition, published by Ferdinand Enke Verlag, Stuttgart 1958. Pp. iv, 303.

This book was originally arranged by Dr. L. Adam in 1936 but it had to be published without his name on account of the political situation in Germany at that time. Its third edition has now appeared under his name and that of Dr. H. Trimborn, Professor at the University of Bonn. It does not intend to give a representation of the culture of different tribes. Its aim is the discussion of the essence of ethnology and its auxiliary branches as well as an explanation and critical treatment of its methods. More than 10 ethnologists of repute have given their scholarly contributions : H. Trimborn analyses the different methods in ethnology ; L. Adam with F. J. Micha reports on modern dating processes ; R. Thurnwald describes the intellectual and social life of the primitives ; F. Herrmann their poetry ; Marius Schneider their music (with 112 musical staves) ; G. Deeters their languages ; K. Dittmer their economy ; H. Nevermann their ergology and technology adding 91 instructive sketches (agricultural and domestic tools and boats, houses, craftsmen's tools, textile, weapons, music instruments) ; D. Westermann with L. Adam and U. Oberem discusses their future. L. Adam is in his real element in his essays on primitive art (with 20 illustrations) and on primitive law. W. Froelich provides valuable catalogues of ethnological periodicals as well as of the museums of the whole world.

The contributors have gathered much important ethnological data and have treated many problems in their 14 clear-cut chapters. Yet all this will not tire even a busy reader because of their precise representation and concise form.

E. A. WORMS.

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